A Clinical Lecture

ON

A CASE OF INTERNAL DERANGEMENT OF THE KNEE-JOINT.[1]

Delivered at St. Mary's Hospital

BY EDMUND OWEN, F.R.C.S. ENG.,
SURGEON TO THE HOSPITAL.

From Notes taken by Mr. J. M. POOLEY, *Clinical Clerk and Dresser.*

GENTLEMEN,—The case that I am going to demonstrate to you is that of a man with a damaged internal semilunar fibro-cartilage, and before the patient is wheeled in I may tell you that he is an artisan and an international (Rugby) football player. I will have him stripped, and I think that you will agree with me that he is a splendid specimen of muscular development. One rarely has the opportunity of seeing so well-made a man—at least in hospital practice. When he comes in and stands up you will notice the enormous mass of the muscles on the front and sides of his femora, but if you look carefully you will see that there is evident wasting of the right thigh. Here he is. He is 25 years of age and his history is briefly as follows. He first twisted his right knee at football in November, 1898. This was followed by much swelling and tenderness, so a splint was applied and he was laid up for a month, after which he again started playing and continued with it through the season. In June, 1899, he gave the same knee a sudden twist at cricket; he fell down and was unable to move. He then had to give up work for a month and he has not been right since. On Sept. 30th, 1899, at the beginning of a football match, he had another recurrence of his trouble, and the medical officer of the club advised his coming to St. Mary's Hospital for an operation.

Notice once more that the right thigh is not so massive as the left. Wasting of the neighbouring muscles is an invariable and early sign of disease of a joint, and sometimes before it is very obvious to sight or to measurement its presence may be recognised by gripping up a large mass of the muscle first of one limb and then of the opposite one, when a marked flabbiness is noted on the affected side. In thus estimating the amount of vigour of the muscles the same hand must be used for each side. Obviously you cannot institute a fair and efficient comparison if you grip the muscles of the left thigh with your right hand and of the right with your left hand as the man sits in front of you.

Wasting of the muscles in joint-disease is not caused merely by want of use. As a matter of fact this man has rested his damaged limb but little; you will hear that he has been occasionally playing hard, county football, and as captain of his local club he has been constantly playing in matches of less importance, and he cannot do this with *one* limb. No, a man who walks, who works, and who plays football cannot rest his thigh very much, yet you notice that one thigh is comparatively small and that its muscles are flabby. There must be some other explanation for this phenomenon, and I offer it thus. When a joint is inflamed, nature does her best for it by keeping it as quiet as she can, and she effects this by taking all the energy out of the muscles which act upon the joint by a process of starvation. The afferent nerves from the damaged joint convey to the grey matter of the cord an impression which passes to the trophic cells in the anterior cornu of the crescent where the nerves arise which control the nutrition of the muscles. This molecular disturbance in the crescent results in an inhibitory influence upon the nutrition of the muscles. The phenomenon, I take it, differs only in degree from the wasting of a group of muscles which follows the gross lesion in the crescent due to poliomyelitis. As our powers of minute investigation increase it may become possible for the microscopist actually to demonstrate the existence of such a histological change in the vesicular matter of the cord in a case of old-standing articular disease, but in the meantime the theory which I venture to offer is not undeserving of consideration.

There is a small amount of fluid in the joint, and by compressing the upper and lateral parts of the capsule you can make the synovial membrane bulge at the lower part and possibly also you may at the same time cause the patella to "float" off the trochelar surface of the femur. This fluid is thin sero-synovia stained with blood, for when a man wrenches a fibro-cartilage there must needs be some tearing of blood-vessels and consequent hæmorrhage.

As you flex and extend the leg you do not notice any impediment to motion, nor do these gentle antero-posterior movements cause discomfort to the patient. At present there is no pain in the joint, but if you press with the end of your index finger into the crevice between the internal condyle of the femur and the head of the tibia in front of the internal lateral ligament he will tell you that it hurts him. That spot corresponds, of course, to the anterior part of the internal semilunar cartilage, and I believe that if you carefully compare the two knees you will agree with me in thinking that there is less resistance in that crevice upon the damaged knee—that, in other words, the semilunar cartilage is not occupying its proper position.

Altogether the symptoms point to a displacement of the disc towards the central part of the joint, and in my experience nothing short of a cutting operation will put the knee right. Splints, knee-trusses, pads, or retentive apparatus are sometimes prescribed for cases like this, but they can keep the knee right only in crippling it. Certainly if we prescribed such treatment for this patient he would have to be shut out from the enjoyment of all violent athletic exercises. On the other hand, the operation is by no means free from anxiety and risk. The surgeon who undertakes an operation upon a semilunar cartilage should thoroughly realise the fact that the responsibility attaching to him is great. I cannot imagine a much more serious surgical calamity than that of septic inflammation following an operation upon the knee of a young man who, but for there being something amiss with the working of a joint, is in perfect health and vigour. A mere forgetfulness, the omission of some detail in the preparation or in the operation, may involve the loss of the joint or of the limb, or even of the life of the individual. And although the joint does not become septic the condition just subsequently to the operation may cause the surgeon intense anxiety. I passed through such an experience a few years ago after operating upon a very nervous man. His temperature went up and sero-synovial fluid collected in the sub-crureal pouch to such an extent that I had to make a counter-opening. As soon as I did this everything went well, and in the following year the patient played himself into the captaincy of his golf club.

In a case of this sort the surgeon must not rush at the operation. He must have the patient if not all the time in bed at least laying up for the best part of a week before operating. We kept this young fellow in the ward for five days before operating. During this time the man and his joint were, so to speak, "training" themselves for the ordeal, and during this very needful period of training we had long lateral splints of gypsum moulded on to the limb to be ready for application after the operation. We gave him morning doses of Epsom salts, and we shaved, scrubbed, and cleansed his limb, and by the time that we were ready for him the synovial effusion had disappeared and the joint was absolutely quiet. During this time, also, we had assured ourselves that his urine contained neither albumin nor sugar. This was a very necessary assurance, for had he been albuminuric or diabetic—as even an apparently healthy young man may be—his tissues would have been improperly nourished, and the inflammation which necessarily follows the surgeon's knife might have far exceeded proper limits. Inflammation, I may remind you, is the "succession of changes taking place in a living tissue," and so on—you remember the definition—and as living tissues are "injured" when they are incised, inflammation necessarily follows every wound that the surgeon makes. Indeed, without inflammation the wound could not heal. Inflammation is, therefore, the surgeon's friend, it is only when it becomes septic and destructive that the surgeon dreads it, and then the fault is often his own.

Operation.—A vertical incision was made about three inches long a little behind the inner border of the patella,

[1] This lecture is the sum of clinical remarks made upon three separate occasions.

and when the bleeding had been arrested the synovial membrane was freely incised and the interior of the joint was inspected. It was at once seen that the anterior part of the internal semilunar cartilage, torn and ragged, was out of its proper place, lying between the articular surface of the inner femoral condyle and tibial tuberosity. Nothing short of its removal could possibly have restored the function of the joint, so I cut it away from the internal lateral ligament and from the tibia. Mr. A. E. Priddle, the house surgeon, and I then explored the joint with the finger to see so far as we could that there was nothing else wrong with the joint, and we washed out the cavity with a few syringefuls of hot carbolic lotion. As there was a good deal of bleeding into the joint we left in a small drain for just 24 hours, and having closed the rest of the wound we put on a dry mercuric wool dressing and fixed the limb in its gypsum splint.

Anatomy.—I may remind you that the internal semilunar fibro-cartilage is the longer of the two, and that its extremities enclose those of the outer; that each disc is connected with the head of the tibia by the weak coronary ligament, and that the internal disc takes a very firm attachment to the articular aspect of the broad, internal, lateral ligament. The outer disc has no attachment like that last named, being separated from the articular aspect of the external lateral ligament by the tendon of origin of the popliteus and its investment of synovial membrane. The outer disc is therefore much less firmly fixed than the inner. If I asked you which of the two discs is more likely to become deranged you would probably say the outer. But so saying you would be wrong, for it is almost always the anterior part of the inner cartilage which gets adrift. Why this should be I confess that I do not know. Theories have been offered in explanation, but I do not think that they give a satisfactory solution of the paradox.

The operation was done on Oct. 19th, 1899, and the temperature-chart shows the highest point recorded to be 99° F. At the end of a fortnight, the wound being solidly healed, massage and movements were begun, and a week later the man left the hospital.

Under date of Jan. 23rd, 1900, a friend of the patient, Dr. Thomas Cooke of Barnstaple, reports:—"His knee is now quite right again, all the thickening has disappeared and he says that it is quite as strong as the sound one. He has made up his mind to play football and I told him that as far as I was able to judge I thought he might do so with safety."

It is interesting to note that through the latter part of the football season now ending the former patient has been playing with great vigour, and that he took part in the final match for the inter-county (Rugby) championship.

AN EXPERIMENTAL INQUIRY INTO SCURVY.[1]

BY FREDERICK G. JACKSON

AND

VAUGHAN HARLEY, M.D. EDIN.

From the Department of Pathological Chemistry, University College, London.)

THE view that scurvy is caused by the want of fresh vegetables or lime-juice, which has been the teaching of physicians and scientists in past years, would appear to require modification.

In the early part of this century, through the efforts largely of Lind, the better feeding of sailors led to the gradual disappearance of scurvy in the naval service, and from this and other observed facts it was conceived that the disease developed whenever individuals did not receive a sufficient quantity of fresh vegetables or some substitute, such as lime-juice, in the diet. Garrod held that the cause of scurvy was a deficiency of potassium salts, while others believed the essential factor to be the absence of organic salts which are present in fruits and vegetables. Ralfe believed that the absence from the food of malates, citrates, and lactates reduced the alkalinity of the blood and thus was the cause of scurvy. It was proved, however, by analysis that the alkalinity of the blood was not diminished, and the majority of evidence showed no diminution in the quantity of potash salts in the scorbutic blood, so that these explanations had to be abandoned. Neale, in an article on "Scurvy in the Arctic Regions," published in the *Practitioner* in 1896, stated that "scurvy is a disease due to want of proper ventilation and want of proper blood nourishment; in fact, scurvy begins with anæmia, and its great antidote is fresh blood." He consequently did not consider that fresh vegetables were of such prominent importance in the warding off of scurvy as the general teaching up to the present has led us to believe. These remarks of his were drawn from practical experience in the Arctic regions, as will be later mentioned.

It is to the sojourners in the Arctic and Antarctic climes that scurvy nowadays is of such overwhelming importance, although in some lands nearer home it is still rife and occasional cases even now occur in our marine services. Credit, as has been already stated, has been given to the use of lime-juice in the Royal Navy and the merchant service for the great reduction of scurvy on board ship, but, as this research will presently show, this conclusion is probably without justification. In the Nares polar expedition the crews of both the *Alert* and the *Discovery* suffered greatly from this affliction although lime-juice was taken daily by all hands when on board. When on the sledging expeditions, in consequence of the necessities of such a condition of travel, only a small quantity of lime-juice was carried, yet an outbreak of scurvy occurred not only amongst the sledging parties but also amongst the men who remained on board ship and continued to take the prescribed allowance of lime-juice daily. On the other hand, Mr. Leigh Smith's party, with its medical officer, Dr. Neale, after the loss of their ship, the *Eira*, spent nine months, including a winter, upon Franz Josef Land, in the severest, and necessarily the most insanitary, conditions imaginable. They had no lime-juice whatever; they almost entirely lived upon freshly killed meat and frozen blood and no case of scurvy occurred amongst them. On comparing these two examples we see that in the case of a body of picked men, well housed, well cared for, and with all possible means for preserving health adopted by those in command, taking the prescribed quantity of lime-juice daily (except in the case of the sledge crews when absent from the ship for a few weeks), but who lived almost entirely on preserved meat, we have universal scurvy; while, on the other hand, we have a party who had not been selected on account of physical fitness, who were cast upon the desolate shores of Franz Josef Land with only the bare necessaries of existence, who passed through nine months of their life there under conditions of considerable privation and hardship and in circumstances which would hardly meet with the approval of any sanitary inspector, who had no lime-juice but who lived on freshly-killed bear-meat and walrus meat, and no symptoms of scurvy appeared amongst them.

No less striking results were obtained by Dr. Nansen and Lieutenant Johansen. These two individuals, after they left the *Fram*, had to spend nine months, including the winter of 1895 and 1896, on Frederick Jackson Island. They were forced to live in a rudely constructed hut, without any changes of clothing or possibilities of washing, so that their sanitary condition was not only of the roughest description but the most unsuitable possible for health, and during the whole of this time they had no fresh vegetables whatsoever, and not even any lime-juice. The only food they were able to use was fresh walrus meat or bear's meat which had been preserved simply by the cold. During this entire period they ate no salted or tinned meats, and we can presume that the bear's meat and walrus meat, as it would freeze almost immediately on being killed, would remain perfectly fresh. In consequence apparently of the purely fresh meat and in spite of the most insanitary conditions Dr. Nansen and Lieutenant Johansen passed the whole winter almost constantly in the dark and without exercise and yet showed no symptoms of scurvy whatsoever. In fact, the results with these two individuals show that the view of Neale, who had laid special stress on the want of proper ventilation as one of the causes of scurvy, was not realised, for the ventilation of their hut must have been extremely bad, as they describe the soot from their blubber-lamps as being deposited everywhere. Before commenting on this a few more examples in reference to this important subject may well be given.

[1] A paper read before the Royal Society on March 1st, 1900. Communicated by Lord Lister, P.R.S. Towards the expenses of this research a grant was received from the Royal Society.

One of us (F. G. J.), when living amongst the Samoyads on Waigatz Island and the Bolshaia Zemclskija Tundra in 1893 and 1894, observed some striking facts as to the cause of scurvy. Amongst those of the Samoyads who invariably winter upon Waigatz, who never take vegetables or know of lime-juice, scurvy is unknown. They, however, live entirely upon fresh reindeer meat. On the other hand, amongst those Samoyads who in the autumn migrate south with the Russian peasant traders from the neighbourhood of Yugor Straits and live in common with them in the districts adjoining the large rivers in north-east Russia upon salted fish—the chief winter food there until the following May—scurvy is prevalent. That this fish is invariably tainted can be testified to from personal experience. In 1893, when at Kharborova, a Samoyad settlement on the Yugor Straits, a remarkable case pointing to the cause of scurvy came under his notice. Six Russian priests, whose religion forbade them to eat reindeer or other such meats but allowed them to eat salted fish, were left in a hut by Siberiakoff (the wealthy mine-owner) to pass the winter, a year or two prior to Mr. F. G. Jackson's visit. A small Russian peasant boy (with whom he conversed) was left to wait upon them. The priests lived almost exclusively on tea, bread, and salted fish; the boy lived upon similar food, except that instead of the salted fish he ate reindeer meat. None of them had any vegetables. In the following May, when the Samoyads and peasant traders returned, they found that all the six priests had died from scurvy, whereas the little boy who had lived upon fresh meat and had not eaten salted fish was alive and well and had buried all his late masters in the snow, he being the only living being in Kharborova in the spring. In the experiences collected by one of us (F. G. J., during his late expedition to Franz Josef Land in 1894, 1895, 1896, and 1897) we have two parties to consider: the crew of the *Windward* who spent the winter of 1894 and 1895 there, no individual of which ever failed to take his prescribed ounce of lime-juice daily, and yet scurvy broke out causing at least one death; and, on the other hand, the land party on shore who took no lime-juice, except two or three of them who used it as a refreshing drink during the first few months, after which none was used. During the three years that they passed in Franz Josef Land none of them suffered from any symptoms of scurvy. The difference between these parties was principally, if not entirely, due to the meat. The *Windward* party used largely tinned and salted meat; while, on the other hand, the land party principally lived on bear's meat, and when tinned meat was employed it passed a severe scrutiny in order that as far as possible it might not even be tainted. From these and other facts it would appear that neither lime-juice nor fresh vegetables prevent scurvy or cure it, that it is not the absence of these which is the cause of the disease, but that scurvy is a disease produced through the eating of *tainted food*.

The view that scurvy is essentially due to poisoning by the ptomaines of tainted animal food was first propounded by Professor Torup of Christiania, and it would appear from the foregoing evidence that such is the case, for in all the cases above-mentioned where any scurvy occurred the men had lived on tinned meats or salted foods. Confirming this view, Dr. George M. Robertson, of the Perth District Asylum, relates a case of a woman who had become an inmate chiefly owing to her malady having taken the form of eating filth from pigs' troughs. On arrival in the asylum she was found to be suffering from spongy ulcerated gums—in fact, from "land scurvy," and ultimately all the teeth, except the canines, fell out. In the many instances of scurvy that we have investigated in no single case have the circumstances rendered inadmissible, or even improbable, the theory that this disease is due to ptomaine poisoning. Before giving to lime-juice the credit of having practically swept away scurvy from the naval and marine services it is necessary to remember that other causes have at the same time been at work to promote health, such as improved sanitation, better quarters for the men, shorter voyages through the enormous increase in the use of steam, and, above all, *better food*. The evidence so far shown, in which men have unwillingly experimented on the effects of ptomaine poisoning, proves that scurvy is produced by the eating of tainted meat and not by the want of fresh vegetables.

In order to confirm or negative this view it was decided to carry out some experiments in this country. After careful consideration it was concluded that the most suitable animals for such experiments would be monkeys, since they are most nearly allied to man. Monkeys are not naturally carnivorous, and therefore it would be necessary to give the meat mixed with food that would not possess any alleged anti-scorbutic properties, and for this purpose it was decided to feed the monkeys on boiled rice and maize. In order to keep the standard of meat as nearly as possible always the same a certain brand of tinned Australian beef was employed. Daily the rice was well boiled, and after becoming thoroughly softened 50 grammes of meat were added to each portion of rice for the various monkeys. It was then well stirred and gently heated; by this means the meat got well mixed with the rice, and although the monkeys might reject some of the larger lumps of meat a considerable portion of it was eaten. At the same time any soluble ptomaines would be absorbed by the rice and thus eaten by the monkeys. To this mixture was added daily a certain amount of maize. The results can be best described by dividing the experiments into three groups.

Group 1.—The monkeys in this group were given daily, together with their boiled rice, 50 grammes of meat from a *freshly* opened tin, together with maize.

Group 2.—The monkeys in this group were given the same quantities of meat as in Group 1, but from tins which had been opened for a few days and had stood in the laboratory. The meat in these tins was not what one would call bad although it had a distinctly sour smell. Rice and maize were given as before.

Group 3.—The monkeys in this series were given exactly the same diet as was employed in Group 2, except that each monkey received daily either an apple or a banana.

We have found in these three groups three conditions, so far as diet is concerned, which ought to yield definite results in reference to the subject of ptomaine poisoning. In order that the general surroundings of the monkeys should be as nearly as possible the same and that each should be properly observed every monkey was kept in a separate cage of similar construction so that the fæces could be easily examined. The cages were kept in a room warmed by hot-water pipes so that they were under as nearly as possible similar conditions as regards light and heat. The excreta of the monkeys were examined daily and the general appearance of the animals was noted, more especially as regards the condition of the gums. Every few days the monkeys were weighed.

We can now proceed to describe the results of the experiments. In order to study the results of each group more easily they are put together in a tabular form.

In Group 1 the monkeys were fed on boiled rice with 50 grammes of fresh meat and maize daily. Six monkeys in this group (Table I.) were kept under observation.

TABLE I.—*Group 1: Monkeys fed on Boiled Rice, with 50 grammes of Fresh Meat and Maize daily.*

No.	Duration of observation.	Weight in kilogramme.			Diarrhœa commenced.	Blood and mucus in stools.	Gums spongy.
		Original.	Final.	Loss.			
	Days.				Days.	Days.	Days.
1	70	2·000	1·450	0·550	62	0	0
2	31	2·250	1·700	0·550	23	0	0
3	28	2·200	1·850	0·350	3	0	0
4	45	2·650	1·950	0·700	7	0	0
5	73	2·750	1·650	1·100	13	0	0
9	39	1·250	1·050	0·200	5	0	0

In the case of monkey No. 5, which lost no less than 1·100 kilogrammes in 73 days, this loss of weight principally occurred during the last seven days, for up to that period this monkey had only lost 300 grammes. During the last seven days, however, severe diarrhœa set in, followed by rapid wasting. The same holds good as regards the other cases. So that although the monkeys on this diet lost weight, possibly from the food not being sufficiently nutritious, the principal loss of weight was apparently due to the diarrhœa. When we come to consider the diarrhœa we see that all six monkeys developed this condition sooner or later. As a rule it commenced by being very intermittent and became more severe towards the end, when it speedily proved fatal by the general loss of strength, &c., which it occasioned. The diarrhœa in monkey No. 1 did not commence until it had been

62 days on the diet, when it proved fatal after seven days. In the case of monkey No. 5, on the other hand, it began after 13 days, but was only slight, and at intervals of three or four days, after which it became very severe; during the last seven days there was rapid wasting, and death occurred on the seventy-third day. In the case of monkey No. 3 the diarrhœa commenced, however, on the third day, when it was very severe, and afterwards, although the diarrhœa was not so acute and occurred only at intervals, the animal became very feeble, and on the twenty-eighth day was killed by chloroform. At the necropsy no cause for the feeble condition could be found, although the large intestine was somewhat congested in this case. In spite of the appearance of this diarrhœa none of the monkeys in the group showed any signs of either blood or mucus in the motions, the liquid stools being merely of a pale yellowish colour. And in all these cases the gums, although frequently examined, showed no sponginess or signs of bleeding. The monkeys of this group as they became emaciated sat hunched up in their cages, the most usual attitude being with their heads between their knees as if they were trying to keep themselves warm, although the room was, as already stated, heated by hot-water pipes. They also showed signs of being out of condition by the general roughened condition of their coats. At the necropsy all these monkeys exhibited more or less marked emaciation, but with the exception of monkey No. 2, which died from pneumonia, in no case was the direct cause of death discoverable. In the bowels were found liquid light-coloured contents and only in the case of monkey No. 3 were there any signs of congestion to be noted in the large intestine.

TABLE II.—*Group 2: Monkeys Fed on Boiled Rice, with 50 grammes of Tainted Meat and Maize Daily.*

No.	Duration of observation.	Weight in kilogrammes.			Diarrhœa commenced.	Blood and mucus in stools.	Gums spongy and bleeding.
		Original.	Final.	Loss.			
	Days.				Days.	Days.	Days.
6	18	2·000	1·400	0·600	5	0	0
7	14	1·350	1·050	0·300	5	8	13
8	55	1·500	0·950	0·550	17	23	27
10	65	1·600	1·050	0·550	7	28	28
11	54	1·650	1·250	0·400	4	26	27
12	11	2·425	2·150	0·275	6	9	0
13	80	2·050	1·900	0·150	0	0	0
20	62	2·450	1·400	1·050	40	40	40

In Table II. the results of eight observations under these conditions are recorded. The monkeys of this group lived from 11 days to 80 days, although in the cases of monkeys No. 8, No. 10, and No. 20 we cannot call this the limit of their life, as they were killed in order to examine the influence which scurvy, thus artificially produced, would have on their blood. We see by this table that we have the same loss of weight in these monkeys as we had in the six monkeys fed on the fresh meat. In this group the diarrhœa commenced earlier than in those previously described. In only one case was it delayed 40 days; in the other cases it commenced between the fourth and seventh days, except in monkey No. 8, in which it did not commence until the seventeenth day. In these, as in the previous monkeys, diarrhœa, although always occurring, was somewhat intermittent. Out of those eight monkeys in no less than six was it seen that the motions were not of the simple diarrhœic character of the former group, but contained blood and mucus. In monkeys No. 7 and No. 12 the blood and mucus appeared on the eighth and ninth day respectively, while in the other cases it was more delayed, the diarrhœa having continued for some time previously to its appearance. In some of the cases the motions just before death consisted principally of blood and mucus. When we turn to the appearance of the gums, we find that in five out of the eight monkeys included in this group they showed sponginess, and in some cases even small ulcers forming. The sponginess of the gums was most marked around the incisors and bicuspids and, as a rule, it did not occur around the molars at all. The monkeys belonging to this group sat in the same cramped position, with roughened coats, as has been already described in the case of Group 1. They showed a more marked disinclination to move or to take interest in objects around them, but in no case did they show any signs of definite tenderness of their limbs when handled. Only in one case (monkey No. 7) was there any indication of bruising. In this monkey a few days before death two bruises developed on the left knee, about half a centimetre in diameter, of a dirty red-brown colour, and also sores showed on the sole of the right foot and at the root of the tail. In all these cases, as in the previous monkeys, a necropsy was carried out. In no single instance were there found any signs of hæmorrhage or hæmorrhages into the pleura, pericardium, or peritoneum. The gums in monkeys No. 8 and No. 10 were not only spongy but had a tendency to the formation of ulcers at the root of the incisors. The stomach and small intestine showed little or no change, while, on the other hand, the large intestine was in the majority of cases (except monkeys No. 6 and No. 13) markedly congested, the congestion being, as a rule, most noticeable at the sigmoid flexure and cæcum. The contents of the small intestine were light yellow, while the large intestine contained more or less bloody mucus. The only thing else abnormal to be noticed was that in monkey No. 7 the liver was enlarged and fatty, showing markedly the line of the ribs.

We now come to consider Group 3 (Table III.). In this the monkeys were fed on boiled rice with 50 grammes of tainted meat and maize daily, but each monkey received in addition an apple or a banana.

TABLE III.—*Group 3: Monkeys fed on Boiled Rice, with 50 grammes of Tainted Meat and Maize daily, each Monkey receiving a Banana or Apple, these being given on alternate days.*

No.	Duration of observation.	Weight in kilogrammes.			Diarrhœa commenced.	Blood and mucus in stools.	Gums spongy and bleeding.
		Original.	Final.	Loss.			
	Days.				Days.	Days.	Days.
14	22	1·600	1·350	0·250	16	18	0
15	180	2·200	1·300	0·900	150	0	0
16	13	1·750	1·500	0·250	8	11	11
17	31	2·476	1·500	0·976	9	20	present*
21	123	2·000	1·650	0·350	90	90	0

* Only noted at the necropsy.

In this group the animals, therefore, in addition to the rice and maize and tainted meat, received fresh vegetables daily, and may be considered to have been well fed. Five monkeys only were used, and in spite of the extra food they all lost food. In fact, monkeys No. 15 and No. 17 lost no less than 900 and 976 grammes of weight in 180 and 31 days respectively. The others, however, did not lose so much weight. In three of the monkeys, No. 14, No. 16, and No. 17, diarrhœa commenced from eight to 16 days after the monkeys had been on this diet. But in monkey No. 15 diarrhœa did not commence until the one hundred and fiftieth day of observation, and in monkey No. 21 not until the ninetieth day. In four of the cases blood and mucus appeared in the motions in from eight to 18 days. When it first occurred in monkey No. 21 it was unfortunately not noticed. The other monkey, No. 15, did not show any signs of it. In two of the monkeys, No. 16 and No. 17, spongy gums occurred; in the former on the eleventh day, while in the latter it was only noted at the necropsy. The other three monkeys showed no signs of bleeding gums. The necropsy of those monkeys which showed scurvy exhibited, as in those of Group 2, marked congestion of the large intestine, with bloody mucus in the contents. In all the cases there was marked emaciation but no hæmorrhage either into the pleura, pericardium, or peritoneum.

After this general description of the results obtained in the three groups of experiments and before discussing their significance we can consider the changes produced in the blood of animals suffering from the results of scurvy—scurvy being defined by Bristowe as "a peculiar form of anæmia arising from a deficiency of vegetable diet, and attended with a tendency to the occurrence of hæmorrhages, profound impairment of nutrition, and great mental and bodily prostration."

BLOOD IN THE SCURVY OF MONKEYS.

In order to get monkeys with as well-developed symptoms of scurvy as possible the animals were kept until not only were they passing bloody mucus by the bowels but

the gums were spongy and easily bled. Unfortunately, the blood of only two monkeys could be examined, as the others died too speedily. The monkeys No. 8 and No. 10 in Group 2, however, both showed very well-marked symptoms of scurvy, as found in monkeys—diarrhœa, wasting, the motions containing blood and mucus, and the gums spongy and easily bleeding.

TABLE IV.—*Comparing the Analysis of the Blood of a Normal Monkey with the Analyses of the Blood of two Monkeys Suffering from Scurvy.*

	Normal.	Scurvy.	
		No. 8.	No. 10.
Weight in kilogrammes	2·000	0·950	1·950
Number of corpuscles	4,730,000	4,220·000	4,500,000
Number of leucocytes	8125	40,000	—
Hæmoglobin	75	48	45
Specific gravity	1046	1035	1034
Water	83·37 %	85·18 %	84·99 %
Solids	16·63 %	14·82 %	15·01 %
Proteids	18·27 %	12·37 %	15·69 %
Fibrin	0·52 %	—	0·76 %
Time of coagulation	3 minutes	2 minutes	1 minute
Nitrogen	2·72 %	2·31 %	—
Ash	0·75 %	0·79 %	—

In Table IV. the results of the analyses of the blood in the case of two monkeys suffering from scurvy are compared with the analysis of the blood of a normal monkey, so that we can more readily see the changes produced. The blood to be examined was collected from the carotid artery while the animal was kept under the influence of ether and when sufficient blood had been collected for the various analyses the animal was killed by an overdose of the anæsthetic before it returned to consciousness.

The number of red blood corpuscles.—These were estimated by the Thoma-Zeiss counter and in each of these cases the average of two blood counts is given, the result being the number of red blood corpuscles contained in a cubic millimetre of blood. It is seen that while in the normal monkey the number of red blood corpuscles is 4,730,000 per cubic millimetre, in the two monkeys suffering from scurvy it is respectively 4 220,000 and 4,500,000. Other observers have drawn attention to the diminution in the number of red corpuscles in cases of scurvy as quoted by Philip Wales in Ashurst's "International Encyclopædia of Surgery." From these results one may conclude that there is a slight reduction in the number of red blood corpuscles in monkeys fed on tainted meat, although this reduction is nothing like the reduction found in the human subject in many of the more severe forms of anæmia.

The leucocytes.—The white blood corpuscles were counted in the same way as the red blood corpuscles. This was carried out on one of the monkeys affected with scurvy. It is seen that in the case of the normal monkey there were 8125 leucocytes per cubic millimetre, while in the case of one of the monkeys suffering from scurvy there were no less than 40,000. Laboulbène notes the occurrence of an unusual number of white globules in scurvy. We certainly can conclude that there is a very marked leucocytosis produced by the diet of tainted meat.

The hæmoglobin.—The quantity of colouring matter in the blood was estimated by Fleischl's hæmometer. In each case precautions were taken to use the same illumination power and at least two calculations were made, the average being taken. It is seen from Table IV. that the hæmoglobin present represents 75, while in both the monkeys suffering from scurvy it is very considerably reduced, being 48 and 45 respectively. When we compare this with the small reduction in the number of red blood corpuscles we see that in the monkeys fed on tainted meat there is produced a very marked hæmoglobinæmia, while at the same time there is probably oligocythæmia. In fact this condition corresponds with that in the human being in cases of chlorosis, as against those forms of pernicious anæmia or secondary anæmia where either the red blood corpuscles are reduced out of proportion to the hæmoglobin or the hæmoglobin and corpuscles are reduced in equal proportions.

The specific gravity of the blood.—The estimation of the specific gravity of the blood in these monkeys was carried out by means of the picnometer. In the normal monkey we have a specific gravity of 1046, while in the cases of the two monkeys suffering from scurvy we have a specific gravity of 1035 and 1034 respectively, so that we can conclude that there is a slight decrease in the specific gravity produced by the diet of tainted meat.

The water and solids of the blood.—A given quantity of blood was collected in a platinum crucible and dried to constant weight at 70° C. It is seen that in the normal blood there was 83·37 per cent. of water and 16·63 per cent. of solids, while in the cases of the monkeys suffering from scurvy the percentage of water was 85·18 with only 14 82 per cent. of solids in monkey No. 8, while 84 99 per cent. of water with 15 01 per cent. of solids occurred in monkey No. 10. It would appear that all observers who have noted the blood in scurvy speak of the marked diminution in the total solids which occurs in this disease, so that we have with the decrease in the specific gravity of the blood a diminution in the total solids, as one naturally would expect.

The proteids of the blood —The total quantity of proteids in the blood was estimated by precipitating a given quantity of blood in 15 volumes of absolute alcohol. After allowing it to stand some days with frequent stirring the precipitate was collected on a weighed filter-paper and dried, &c., in the usual manner. By this method it was found that the normal blood contained 18·27 per cent. of proteids, while in the case of the two monkeys fed on tainted meat the quantity of proteids was only 12·37 and 15 69 respectively, so that there is a very marked decrease in the quantity of proteids in the blood.

The quantity of fibrin.—This was estimated by the method of Hoppe-Seyler in one case. It is seen that in the normal monkey there is 0·52 per cent. of fibrin in the blood, while in the case of the monkey suffering from scurvy the fibrin was no less than 0·76 per cent., so that we see there was a very marked increase in the quantity of fibrin. Chalvet, in his analysis of a case of scurvy, comparing it with healthy blood in the normal individual, found the fibrin 0·216 per cent., while in the case of scurvy it was 0·434 per cent. Busk, in three well-marked cases of scurvy which occurred in the *Dreadnought* hospital ship, found the fibrin in excess of the normal amount, the least being 0·45 and the greatest 0·65 per cent.

The time of coagulation.—The time that it took for the blood to coagulate was estimated by Professor Wright's tubes, and it is seen that in the normal monkeys this is three minutes, while in the case of the monkeys suffering from scurvy it was found to be one and two minutes respectively. The increase in the quantity of fibrin (hyperinosis) with the shortening of the time of coagulation is what is commonly found in hydræmia in the human subject, and may therefore in all probability be put down to the same cause.

The quantity of nitrogen.—The total quantity of nitrogen in the blood was estimated by the method of Kjeldahl, and the average of two analyses is given. In the normal monkey it is seen that the total nitrogen was 2 72 per cent., while in the case of the monkey suffering from scurvy in which it was analysed, it was 2·31 per cent. There is, therefore, a small decrease in the quantity of nitrogen, this decrease corresponding to the decrease in the quantity of proteids, and as this was only analysed in one monkey it is as well, perhaps, not to discuss any theories as to its significance.

The ash of the blood.—The estimation of the ash was carried out in the ordinary way, but only in the case of one monkey suffering from the effects of tainted meat. It is seen that in the case of the normal monkey the ash was 0 75 per cent., while in the case of the monkey fed with tainted meat it was 0·79 per cent. The average amount in Becquerel's, Rodies's, and Busk's cases of scurvy in the human subject was 0·81, the smallest being 0·55 and the largest 1·15 per cent. respectively. Garrod, in the analysis of the blood in one case of scurvy, found a deficiency of the potassium salts, upon which he formed his well-known theory that scurvy was due to the want of these salts. We therefore see, in reference to this monkey, that the ash does not tend to be decreased with the low specific gravity and diminution of the total solids. It is apparent that the diminution in the total solids is principally due to a lessening in the quantity of proteids.

CONCLUSIONS.

The descriptions brought forward in the first part of several cases of scurvy which occurred in the Arctic regions when the individuals were under the influence of preserved

or salted meats, in spite of their taking at the same time either vegetables or lime-juice, of the Nares polar expedition, in which scurvy occurred, as well as the very striking case of the six priests already mentioned, can be compared, on the other hand, with conditions of the greatest hardship and privation in the Leigh Smith expedition, in the case of Nansen and Johansen, and in the Frederick Jackson land party, as well as in the instance given of the Samoyads who winter on Waigatz and who live on fresh meat; in all of which cases, in spite of the entire absence of vegetables or even lime-juice, no scurvy occurred. If we look at this evidence alone we may almost say that we have conclusive experimental evidence that the eating of salted or improperly preserved meat or tainted meat in any form can produce scurvy even when lime-juice or vegetables are being taken at the same time. We have also the support of the fact that bad ventilation, believed by Dr. Neale to be one of the causes of scurvy, was not a cause of scurvy with Dr. Nansen, living on fresh meat and blood—probably owing to the fact that he introduced no ptomaine and therefore no scurvy occurred.

We now come to consider the experiments on monkeys and how much or otherwise these experiments confirm the results already given in man. It is necessary to consider what are the symptoms of scurvy. In the present paper it is impossible to go through all the symptoms of scurvy described by the various observers, since different epidemics have shown more markedly various symptoms. We, however, can compare the symptoms in our monkeys with those generally described as accompanying scurvy. The pallor and yellowish colour of the face, which are described as distinctive in scurvy, are of course impossible to be observed in monkeys, although in those monkeys which we consider to suffer from scurvy there was generally a good deal of blueness about the lips and gums. There was a very marked disinclination to bodily movement and a general tendency to mental prostration, for the monkeys in those cases which showed what we might consider the more definite symptoms of scurvy, such as the bloody mucus and bleeding gums, took little interest in the things surrounding them. At the same time, in none of these monkeys did we find any definite tenderness of the limbs, any swelling of the legs, or any purpura. Only in one case did we get the formation of bruise-like sores in an animal which apparently was suffering from scurvy.

In the monkeys included in Group 1, which were fed on fresh meat as well as maize and rice, the only symptoms we note beyond the wasting is diarrhœa, and none of these monkeys showed anything like the muscular feebleness or general ill-health which was noted in the scorbutic monkeys.

When we compare Group 2 (Table II.), in which the monkeys received the same diet except that the meat instead of being fresh was tainted, we find a very different state of affairs. These monkeys showed a much greater prostration, and although it is difficult to judge by the eye they certainly seemed paler and generally out of condition. No less than six monkeys out of the eight thus fed passed blood and mucus in their motions. The question whether the occurrence of blood and mucus in the motions is to be regarded as one of the symptoms of scurvy can be easily answered by the fact that, first, Bristowe states that "patients suffer from looseness of the bowels, the motions frequently being highly offensive and containing blood." It is also stated by other observers—such as Hilton Fagge and Osler, as well as in an article on scurvy in Ashurst's "International Encyclopædia of Surgery," by Philip Wales—that the occurrence of hæmorrhages in the mucous membrane of the stomach and bowels is of frequent occurrence.

None of our monkeys vomited, so that whether they suffered from hæmorrhages in the stomach cannot be noted. In the post-mortem examination there was no evidence of any such thing. If this bloody diarrhœa is an evidence of scurvy we find that no less than six monkeys out of the eight which were given the tainted meat showed this symptom. We now compare Group 3 (Table III.) in which the monkeys were given fresh fruit, apples, or bananas every day. The monkeys in this case can be said to have been well fed. Five monkeys were observed, and out of these five monkeys no less than four developed the symptoms of bloody mucus in their stools, so that in spite of good feeding this symptom of scurvy developed in four out of the five monkeys on full diet.

We come to the next symptom, undoubtedly the most definite sign of scurvy that occurs in man—in fact, it is about the only condition which is universal in scurvy and it is always found except in those cases in which the teeth are absent—that is, the spongy condition of the gums. When we consider the first group of monkeys which were merely fed on rice, maize, and fresh meat, out of the six monkeys not one showed any appearance of spongy gums, so that we can conclude that in these monkeys none of them showed any scurvy whatever. We now come to the eight monkeys fed on exactly the same diet, in which the meat was tainted instead of fresh, and here no less than five monkeys out of the eight showed sponginess of the gums, and some not only the sponginess but the gums even ulcerated, so that five monkeys out of the eight showed this sign, which is considered by all who describe scurvy as the most significant. We now come to those monkeys which were well fed, getting the fresh vegetables every day. Four of these monkeys showed bloody mucus in the stools, and two of them spongy and bleeding gums.

We have further to consider the condition of the blood in the monkeys fed on tainted meat. Scurvy is considered by all authorities to be a peculiar form of anæmia. In two monkeys we had the opportunity of analysing the blood, and it is seen by the analyses that we have marked changes in the blood, a very great diminution in the quantity of hæmoglobin, with a slight diminution in the number of red blood corpuscles—in fact, a condition corresponding to chlorosis, and that is accompanied by leucocytosis. The specific gravity of the blood is reduced, and this is due to the reduction in the quantity of proteids and not to a marked reduction in the quantity of salines in the blood. The fibrin of the blood is increased, together with an increase in the coagulability of the blood. When we consider what has been found in the blood of man suffering from scurvy we find it universally accepted that there is this condition of anæmia with low specific gravity, the blood being distinctly watery and with a marked excess in the quantity of fibrin. So the condition of the blood of the two monkeys which we have analysed corresponds with that found in the majority of analyses of scorbutic blood. Considering, therefore, the occurrence in the monkeys fed on tainted meat of bloody mucus in the stools, spongy gums, and characteristic anæmia, we assume that, although the symptom of hæmorrhages into the tissues was not observed, we may fairly conclude that they were really scorbutic. This conclusion is further justified when we consider, on looking over the description of scurvy given by authors, that all the symptoms except the sponginess of the gums are very often absent in different epidemics.

The fact that the five monkeys fed on tainted meat, with which fresh vegetables were given, showed in a smaller proportion the symptoms of scurvy than did the monkeys in the second group can be sufficiently explained by the fact that when the monkeys received a banana or an apple every day they would be less likely to eat as much of the meat as they would otherwise do and would thus daily receive a smaller dose of ptomaine. In spite of this fact in no less than four cases out of the five did we get bloody motions and in two of the cases spongy gums. In these cases tainted meat alone seems to have produced scorbutic symptoms, although the animals in this group took longer to develop the symptoms and seemed not to suffer in such a severe form.

Looking at the results of our experiments on monkeys as a whole we venture to think that they afford important confirmation of the conclusion derived from Arctic experience, as referred to in the early part of this paper, that the presence of fresh vegetables or lime-juice is not alone sufficient for the prevention or the cure of scurvy, and that we must regard the condition of the food in general, and especially the state of preservation of the meat, as the essential factor in the etiology of the disease.

We have to express our thanks to Dr. Francis Goodbody for his untiring assistance in the numerous observations that had to be made in the 18 months during which the research was continued.

SOCIETY FOR THE PREVENTION OF CRUELTY TO CHILDREN.—The annual meeting of the Gloucester and district branch of this society was held on April 19th under the presidency of Colonel Browne. The report stated that during 1899 there were 68 complaints received—an increase of eight over 1898—and that 62 of these proved to be well founded. 36 persons were warned, 15 were prosecuted, and 11 were otherwise dealt with. 171 children and 87 offenders were involved. The financial statement showed a deficit of £46.

ENDOSCOPY OF THE ŒSOPHAGUS AND STOMACH.

BY DR. GEORG KELLING.

I.—A FLEXIBLE ŒSOPHAGOSCOPE WHICH CAN BE STRAIGHTENED BY A PULLING AND TURNING ACTION.[1]

MANY attempts have been made during the last 30 years to inspect the œsophagus of a living person. The first trials were made by laryngologists who, being accustomed to inspect the larynx and the trachea by means of the laryngoscope, were also inclined to examine the œsophagus in a similar manner. This method, however, is erroneous. Much attention has been devoted to the task of devising an instrument for this purpose. Stoerk has experimented with a pair of tongs, the three portions of which could be spread apart after introduction. Treitel uses an angular instrument, the two sides of which are connected by a moveable joint and are introduced point first in a folded condition. The upper ends are then screwed asunder by a long screw which lies in the mouth. Bevan, and at a later period Waldenburg, introduced a tube into the œsophagus. Stoerk used a flexible tube and then he introduced several tubes placed one inside the other like a telescope, capable of being pushed out mechanically. Eventually skeleton tubes were used by Mackenzie and Löwe. In this manner, however, although the apparatus might be ingeniously constructed and the mirror provided in the right position with electric light fastened on the tube (Stoerk), œsophagoscopy could never be satisfactorily practised. To inspect the œsophagus by means of the laryngoscope is a principle which readily suggests itself but it is nevertheless wrong. In this way we can neither examine the œsophagus nor conveniently make use of instruments for the purpose of wiping off mucus or extracting foreign objects or removing portions of the tissues with a view to microscopical examinations or sounding and dilating strictures, &c. One must be able to look straight into the œsophagus. The merit of having recognised this and put it into execution for the first time belongs to Mikulicz. He introduced a rigid tube, the lower extremity of which was covered with a cap of hard indiarubber. It was illuminated with electric light reflected from a lamp placed outside the body. This instrument devised by Mikulicz has been employed by von Hacker who has carried out numerous examinations with it and has made known the diagnostic and therapeutic results obtained. During the last few years Rosenheim, Einhorn, and myself have practised œsophagoscopy. Rosenheim used an instrument in all essential parts similar to that of Mikulicz. Stoerk's new instrument was the means of bringing about an advance in œsophagoscopy. He fastened to the lower end of a rigid tube a series of tubular segments with flanges. In front the segments were cut out whilst at the back they touched one another when straightened. After insertion the instrument was straightened by rotating it through 180° and by pressing it against the vertebral column. By a further development of Stoerk's principle the problem of œsophagoscopy may be resolved in a satisfactory manner. It is certainly somewhat unnatural and dangerous to try to insert a rigid straight tube into the œsophagus, which is naturally curved. To avoid these disadvantages and at the same time to preserve the advantage of a straight tube permitting visual inspection nothing else remains but to insert an apparatus in a flexible condition and to convert it afterwards into a rigid straight tube. I have already announced such an apparatus in my paper on Œsophagoscopy and Gastroscopy.[2] I publish it only now when I possess sufficient experience in its application and have so far improved it that as I believe no essential improvements remain to be made.

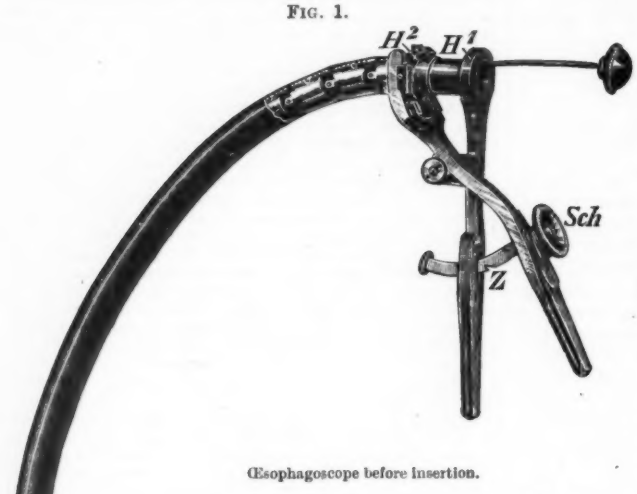
The principle of my apparatus is taken from the finger, which for this purpose must be imagined to be hollow; the bones must be supposed to be replaced by small hollow cylinders joined by hinges; instead of the extensor tendons there is a wire; and instead of the skin there is a covering of indiarubber. The apparatus consists of segments which are tubes or hollow cylinders about one and a half millimetres (one-seventeenth of an inch) thick, 13 millimetres (half an inch) in external diameter, and 17½ millimetres (seven-tenths of an inch) long. Upon each segment on the right and on the left there is a flange half the thickness of the cylinder walls, which flanges fit into a suitably prepared surface upon the next segment. Each of the flanges is connected by means of rivets to the next segment. The ends of the segments are beveled in front whereas they are horizontal on the back, so that the segments are in contact at the back. The segments are covered by a thin indiarubber tube. On the back of each segment there is an eye which is perfectly smooth, being of metal soldered in the sleeve, polished and then perforated. A wire passes through the eyes from the lowest segment to the uppermost. The segments are secured at the mouth to a sleeve which is provided with a longitudinal slot on the back (Fig. 1, H 1). Below this sleeve there is a second sleeve (Fig. 1, H 2) which is shorter than the sleeve H 1 and is furnished with a projection which slides in the slot of the sleeve H 1. The wire is secured to this projection. If the shorter sleeve is pushed forward the wire is tightened and by this means the tubes are straightened. This sliding motion of the sleeves is effected by means of levers. When the ends of the levers are pressed together the tubes are straightened. Between the two levers there is an automatic stopping device consisting of a bow which has a notch filed in it and on its concave surface the bow has a spring which makes the notch catch on a projecting piece when the tubes are in the straightened position. To enable an accurate adjustment to be made when the wires have become somewhat stretched by use the bow is connected to the upper lever not rigidly but by the agency of a screw (Sch), so that a certain amount of adjustment is possible. By fixing the notch in position by means of the projection and then straightening the tube by means of the screw we obtain an assurance that whenever the notch catches on the projection the tube will be straight. By simply pressing upon the bow the notch is released from the projection piece and the tube once more becomes flexible. For the insertion an ordinary steel wire or rod with a sponge attached to the end can be used; this sponge must be renewed after each operation or examination. The lower opening can, however, be closed by means of hard indiarubber or a distended rubber ball or small balloon; this is, however, a mere matter of detail. For illumination either Leiter's pan-electroscope or the Kasper hand-lamp is used, which covers one-half of the lower end of the tube. For long œsophagoscopes the illumination is sometimes not altogether sufficient if one is looking for small objects which are not easily visible. For this purpose I then insert into the instrument, when straightened after the introduction, a platinum pin provided with a device for keeping it cool, just as in the Oberlaender urethroscope, and nearly as long as the œsophagus. This, however, is only necessary with those instruments which are 45 centimetres (18 inches) long.

For practical use my instrument is manufactured in four different sizes. For adults there are three sizes, all of 13 millimetres (half an inch) external diameter and 45, 37½, and 30 centimetres (18, 15, and 12 inches) long, the attached piece, nine centimetres (three and a half inches) long, which projects beyond the mouth, not being included. For children this instrument is 10 millimetres (0·4 inch) external diameter and 30 centimetres long. Fig. 1 shows the instrument curved in the flexible condition and provided with a cap for the insertion. Fig. 2 shows the instrument straightened for inspection of the œsophagus. Œsophagoscopy is contra-indicated in those conditions which preclude examination and straightening of the œsophagus as, for instance, in all cases in which mere examination causes severe bleeding, in varix of the œsophagus, in cirrhosis of the liver, in far-advanced carcinoma, and in cases where the walls of the œsophagus are friable or its diameter is unusually small, for the straightening of the apparatus enlarges the diameter of the œsophagus. As a precaution it ought to be previously ascertained whether an olive-headed bougie having a diameter of about three millimetres (one-eighth of an inch) greater than that of the œsophagoscope can reach the spot to be inspected. Further contra-indications are—arterio-sclerosis of the aorta, aneurysm, adhesive pericarditis, supposed tuberculosis in the mediastinum or in the vertebral column, and curvature of the latter. Moreover, persons having a short or stiff neck or a prominent upper jaw cannot endure

[1] The apparatus can be obtained from Eugen Albrecht, Dresden, Grunaerstrasse, 28 b.

[2] Boas: Archiv für Verdauungskrankheiten, Band ii., p. 324.

FIG. 1.



Œsophagoscope before insertion.

FIG. 2.

Œsophagoscope straightened after insertion.

straightening of the œsophagus; this, however, we soon learn during the straightening of the instrument by the painful sensations experienced by the patient—a feeling of tearing in the throat. There can be no danger if these precautions are observed. With persons who can tolerate a bougie in their œsophagus œsophagoscopy requires no anæsthetic. As a rule, however, the pharynx and the larynx must previously be brushed with a 10 per cent. solution of cocaine. General anæsthesia must by all means be avoided. In quite exceptional circumstances, however, it may be permitted, as, for instance, with restless children and with persons in a state of great excitement if the examination admits of no delay. In such cases I give from one to two centigrammes (from one-sixth to one-third grain) of morphia subcutaneously a quarter of an hour beforehand.

Œsophagoscopy with my instrument is exceedingly easy, quite free from danger, and may be performed by anyone who understands sounding the œsophagus. The patient must not recently have eaten anything. Any considerable quantity of mucus which may have gathered in the œsophagus must first be removed. The best of all methods is to use an ordinary table cushioned all over. The patient sits on the table, care being taken to place him so that on passing from a sitting to a lying position his head hangs freely over the edge. The apparatus is lubricated externally with glycerine and the point is inserted in the cap already mentioned. Whilst the patient is sitting on the table the medical man stands on a low stool and inserts the œsophagoscope with the curve forwards like a flexible bougie. Then the patient lies down on his back and his head, which hangs backwards, is held by an assistant. By pressing the handles of the lever against each other the œsophagoscope is slowly straightened, a proceeding during which the patient must not suffer pain. Before the œsophagoscope is quite straightened the handle is turned through an angle of 90° and the projecting piece now catches in the notch. The object of this is to enable the principal curves of the instrument to be straightened by the substantial rivets of the tube and not by the weaker wire. If the œsophagoscope lies in the right corner of the mouth it is given a quarter turn to the right; if it lies in the left corner of the mouth it is turned as much to the left. As a rule that side is preferable where there are appropriate gaps in the line of the teeth. A second little expedient is this: the apparatus is quite inflexible towards the back, where the links—i.e., the segments—touch one another when in a straightened position. On the front side, however, where in the links corresponding portions are cut away, the apparatus is less rigid, so that by pressure it yields a little and a curve is thus formed. Therefore, if we wish to inspect an object which lies far away towards the back of the apparatus and if the instrument by pressing against it should bend a little we may easily avoid this by a previous rotation to the extent of 180°. Before the examination wadding to wipe off the mucus and a pair of forceps of the requisite length must be provided. After the examination the projecting piece is released from the notch and the instrument, which is now flexible, is withdrawn. The instrument is cleaned and rendered aseptic by boiling, previously to which the indiarubber covering may be removed.

The œsophagoscope is used to a considerable extent, although it would seem that many hospital physicians and surgeons do not avail themselves of it for the purpose of advancing their diagnosis from the stage of probability to that of certainty. In the case of narrowing of the œsophagus, especially if we use the forceps to remove portions of tissue for microscopical examination, we can decide whether carcinoma, syphilis, spasm, cicatrix, diverticulum, or compression of the œsophagus is in question. In this branch of diagnosis I have had very good results and in cases that had been declared by eminent physicians to be carcinomatous I have ascertained by the œsophagoscope that they were other diseases. The therapeutic results are equally useful. Foreign objects which had been swallowed can be extracted. Another instrument, however, is wanted for the purpose of breaking up foreign bodies such as artificial teeth, and I am now engaged in the construction of such an instrument. Under particular circumstances—e.g., in the extraction of sharply-pointed sets of artificial teeth—it may be of some use to combine œsophagoscopy with œsophagotomy. The œsophagoscope is then inserted through the fistula in order to effect the extraction. In this case the patient suffers less pain, we also come within easier reach of the foreign object, and in extracting it avoid the narrow part of the œsophagus at the level of the cricoid cartilage. Moreover, by the œsophagoscope strictures can be successfully sounded when the usual method of blindly touching fails. Also laminaria pencils (tents) and permanent cannulæ can be successfully inserted by means of the œsophagoscope. Finally, we can carry out all such measures as are used in the treatment of morbid conditions of the larynx, the urethra, &c., together with the making of incisions and the local application of caustic, liniments, powders, injections, and the galvano-cautery. We are now too conservative in the treatment of inoperable carcinomata. If progress is made in this direction we shall be able by means of the œsophagoscope also to attack carcinoma in the œsophagus. I must mention that in the rare cases where hæmorrhage occurs from œsophageal varix—hæmorrhage which is almost always fatal—I should invariably try to plug the œsophagus with strips of gauze three feet in length. In doing this I would insert into the straightened œsophagoscope a smooth thin-walled metal tube in order that the gauze might not catch on the links. We know that in 5 per cent. of the

cases of ulcer of the stomach death is caused by bleeding. May we venture to plug the stomach by means of the œsophagoscope in cases of hæmorrhage threatening to be fatal? This question can only be answered by experiments on animals.

Everyone who uses the œsophagoscope for patients must be well acquainted with the normal appearance of the œsophagus in the living subject. In endoscopy, as everywhere else, the rule applies that the experienced examiner sees at a glance what the inexperienced one does not find after long search. I hope that by means of my instrument œsophagoscopy will be universally adopted and will become a permanent addition to our clinical methods, in like manner with laryngoscopy, cystoscopy, &c.

II.—A FLEXIBLE GASTROSCOPE, CAPABLE OF BEING STRAIGHTENED AND HAVING A MOVEABLE PRISM.

Our means of diagnosing the diseases of the stomach are in many cases insufficient. It is a fact that by the usual methods we are quite unable to recognise the beginning of carcinoma of the stomach, neither can we decide with certainty whether an ulcer in the stomach has or has not degenerated into carcinoma. Reliance on chemical tests will in these cases often lead to disappointment. In many cases it is impossible to make a differential diagnosis between chronic catarrh and carcinoma of the stomach or between organic diseases of the stomach and the neuroses which simulate them. Our usual means allow of diagnosis only in advanced cases. We therefore can hardly pretend that our diagnostic routine furnishes us with a good idea of the condition of the stomach and that we have no need of other methods. On the contrary, we most urgently want a method enabling us either to make an early diagnosis of carcinoma or to exclude it with certainty. In this respect I am, as I believe, in agreement with all surgeons familiar with this branch of practice, all of whom recommend frequent recourse to exploratory laparotomy.

In deciding whether gastroscopy is to be made use of we have first to discuss the position as between gastroscopy and exploratory laparotomy. I believe I can give an impartial answer to this question, as I employ not only gastroscopy but also exploratory laparotomy followed eventually by a further operation. Exploratory laparotomy is not a dangerous operation but it is by no means one to be lightly undertaken. First of all, in most cases general anæsthesia is essential. The danger of infection is, of course, reduced, but we cannot fairly maintain that it can be absolutely avoided. In our best hospitals 5 per cent. of aseptic wounds continue to show suppuration due to the sutures. The confinement in bed and the difficulty of expectoration lead with many patients to a risk of pneumonia, in addition to which, moreover, hernias and adhesions may ensue. We must also admit that many patients after exploratory laparotomy suffer great pain and fits of vomiting occur when the abdominal wall is newly sewn up. The inconveniences of gastroscopy cannot be compared herewith. The great majority of my patients, unless they were exceptionally sensitive or timid, bore the examination pretty well.

It makes no inconsiderable difference to a patient in whom carcinoma has been erroneously presumed whether, on the one hand, he can after an examination of about five minutes walk home completely reassured or, on the other hand, must undergo a surgical operation and pass a week or two lying in bed. Moreover, the question has to be considered, What are the results of exploratory laparotomy compared with those of gastroscopy? The former has the undeniable advantage that by it we learn the conditions existing external to the stomach, such as adhesions, glands, metastases, &c., and if an operation proves necessary it can be performed at once. Under these circumstances laparotomy is of undoubted value, but, on the other hand, if an operation is impossible the exploratory laparotomy turns out to the patient's disadvantage. Although the condition of the abdominal contents external to the stomach can be ascertained it must not be forgotten that in this way much less information is obtained as to the internal state of the stomach. For instance, it is in most cases quite impossible to tell whether there is a gastric ulcer or not. If an ulcer has thick walls a more correct opinion can be formed regarding it when it is seen from the mucous side of the stomach than when it is seen from the serous side. It will be remembered that in resection the shape and size of the ulcer can only be ascertained by afterwards examining the mucous surface. It is therefore probable that with increasing experience we shall from inspection of the situation and shape of the thickening be better able to decide as to the chances of its operability.

By means of gastroscopy we can with certainty ascertain the condition of the mucous membrane and the extent of any changes that may be taking place in it. The appearances are as distinctly seen as if the eye was looking directly at the part in question. The views of the bladder obtained with the cystoscope are less perfect, as it cannot be filled with air and the water which is used for this purpose absorbs much of the light.

The question now presents itself, Is gastroscopy dangerous? The use of rigid tubes in œsophagoscopy has been recently recommended by Rosenheim, Epstein, Killian, and Kirstein as a practical method presenting no considerable difficulties. This being so, it is a singular thing that rigid tubes have been regarded with less favour in gastroscopy than in œsophagoscopy. The introduction of such tubes is much more dangerous in œsophagoscopy than in gastroscopy, because in the former case we have usually to deal with œsophagi undergoing morbid alterations, whereas in the latter the œsophagus is almost always healthy. Moreover, the use of rigid tubes for œsophagoscopy is by no means necessary, for I brought out a flexible instrument more than a year ago and have shown it before the Surgical Congress, before a Silesian society, and in the wards of hospitals, on all of which occasions it proved itself capable of practical application. I have made more than 100 separate examinations of about 80 patients by means of the œsophagoscope without any accident whatever. I do not mean to say that an accident cannot happen—whoever understands the matter will agree with me—but when the œsophagus is healthy, as is usually the case when gastroscopy is required, this proceeding if carefully employed may be considered to be safe. If, then, we reckon up the deaths that are known to have occurred up to the present time when rigid tubes have been inserted in the hundreds of examinations that have been made the mortality would be considerably less than 1 per cent.—that is to say, it might be quite well compared with the mortality of exploratory laparotomy. By the employment of flexible instruments I hope to be able to reduce the mortality in gastroscopy to zero.

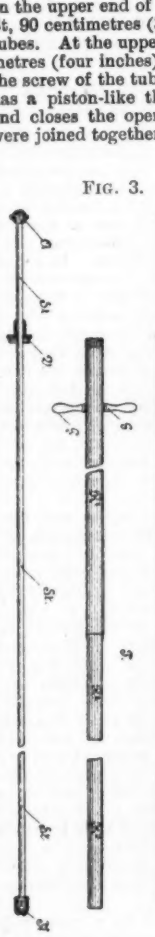
Lastly, we have to refute an objection which has been made against gastroscopy and which appears in some of the most recent treatises on diseases of the stomach—the objection that no results have up to the present been obtained by means of it. It must be admitted that those who have used the method of Rosenheim with straight instruments have not as yet published any cases in which gastroscopy has proved its utility, a circumstance which may be explained on anatomical grounds. On the other hand, the method of Mikulicz, who uses an instrument bent at an angle and having a bent point, has yielded excellent results. For instance, in 1883 Mikulicz diagnosed an ulcer with it and recognised hardness of the pylorus as a symptom of carcinoma. I have published several cases in which the instrument in my hands made known the existence of tumours not discoverable by palpation, and another thing of much greater importance is that it has enabled me to make sure of the absence of carcinoma in several cases in which its clinical symptoms were manifested. During a visit to the surgical clinic at Breslau in the summer of 1898 I had several opportunities of practising œsophagoscopy and gastroscopy for which I was indebted to the kindness of Professor Mikulicz, the founder of the method and an operator extremely skilful in the practical application of it. Professor Mikulicz uses the apparatus modified by myself and described as a "bent rotatable gastroscope." As a proof of the practical utility of the method I will mention two cases which were examined by Professor Mikulicz and myself. They were two men in whom carcinoma was suspected, although no tumour could be felt on palpation. In one case I could demonstrate that the disease was only chronic catarrh; in the other I found a carcinomatous ulcer of about the size of a shilling in the antrum pylori at the small curvature. An operation which was performed completely confirmed the result of the gastroscopic examination. Such an amount of success is a sufficient justification of œsophagoscopy as a clinical method, in spite of the fact that its utility is denied by many medical men.

For endoscopy of the stomach it is necessary that the oro-œsophageal tract should be straightened from the teeth to the cardiac orifice of the stomach. The possibility of accomplishing this has for a long time been proved by the performances of the sword swallowers, feats the originator of which is unknown. Ewald in 1896 claimed that he was the first to introduce rigid straight instruments (thermometers) into the stomach for scientific purposes. For the history of œsophagoscopy and gastroscopy we require to know who it was that first recognised the necessity for straightening the oro-œsophageal tract and who it was that first gave practical application to this discovery. In both respects priority belongs solely to Mikulicz who in 1881 brought out and used the first gastroscope. For the œsophagus Mikulicz employed straight instruments, but for the stomach he recommended a rigid bent one. He showed that a rod could be passed into the œsophagus as far as the cardia (the ninth dorsal vertebra), but that it could not be passed further on account of the normal kyphosis of the spine and also on account of the pancreas. The extremity of the gastroscope for a length of 15 centimetres (six inches) was therefore bent at an angle of 150°. It has now been found by Rosenheim and Perl, and the observation has been confirmed by Rewidzoff, Kuttner, and myself, that a straight rod can be passed further still—namely, in most cases as far as the level of the umbilicus or the great curvature of the stomach. This discovery has led Rosenheim to use a straight gastroscope. The idea is at first sight attractive on the ground of its simplicity. Such an apparatus is easy to make, for it is merely a Nitze cystoscope of the requisite size with its angle straightened. Moreover, it can be easily rotated in the stomach, and if the tube is separated from the optical apparatus the latter can be easily withdrawn, as, for instance, in the event of the prism having become soiled. Different refracting prisms may also be inserted, but this, although it may appear to be a simple matter, is not easy in practice, because on inserting a new prism fresh adjustments have to be made. It was Rosenheim, and after him Rewidzoff and Kuttner, who first led the way to gastroscopy; the two latter endeavoured to avoid the introduction of the rigid tube.

There is no need any longer to speak of the construction of a straight gastroscope. In a former paper,[3] the results of which have not been acknowledged by Rosenheim, Rewidzoff, and Kuttner, I have demonstrated that a straight gastroscope cannot be a universally practical instrument. Mikulicz has, after all, been right with his angular shape. In order to prepare a reliable foundation for gastroscopy I undertook some anatomical researches which had not up to that time been entered on. It was obvious that the various parts of the alimentary tract from the cardia to the entrance of the mouth must be all brought into a straight line. To bend the apparatus, as Kuttner proposes, corresponding to the angle between the mouth and the œsophagus in a right angle, is a complicated arrangement and in practice only an obstacle. The stomach in this axis has a length of from 15 to 25 centimetres (from six to ten inches), and means have to be found for examining its walls within these limits. It is optically impossible to inspect the whole length equally well from the centre; we must therefore be able to give different positions to the window of the apparatus, and this can only be conveniently done if the mouth and the œsophagus are in a straight line. Many medical men still believe that it would be better to use a flexible gastroscope similar to an india-rubber tube. Perhaps it may be possible to make an optical apparatus of this kind at some future time, when an electrical method of viewing distant objects has been discovered, but even then the flexibility of the apparatus will be useful only for introducing it and not for inspecting the stomach. It must not be forgotten that what is required is information about the state of the stomach, that certain portions of it must be distinctly brought into view, and that for this purpose rigidity of the optical apparatus is necessary. This must be understood if further endeavours to improve the instruments are to lead to a useful result.

First of all it is necessary to know what position is occupied by a straight rod passed into the stomach from the mouth, or, in other words, what position this gastroscopic principal axis has in the stomach. This I ascertained by means of a number of observations on the dead body. The rod which I introduced for this purpose is shown in Fig. 3. From the lower end K to the upper end A it measured 90 centimetres (36 inches). Part of it was a tube (R 2) 12 millimetres (half an inch) in external diameter and 35 centimetres (14 inches) in length. At its upper end this tube was cut across and fitted into another tube (R 1) 14 millimetres in diameter and 45 centimetres (18 inches) in length. The tube R 2 can be inserted into R 1, and they are joined end to end by the tapering ring T which is made to correspond to the dimensions of the two tubes. When connected together the two tubes are 80 centimetres (32 inches) long. The upper one is fitted with a handle G at a point five centimetres (two inches) from its extremity. In the upper end of the tube there is a screw. A steel rod St, 90 centimetres (36 inches) long, is now inserted into both tubes. At the upper end of it there is a button A, 10 centimetres (four inches) from which there is a screw V fitting the screw of the tube R 1. At the lower end the steel rod has a piston-like thickening K which exactly fits into R 2 and closes the opening at its lower end. When the tubes were joined together and the steel rod screwed in, the whole formed a strong rod with a rounded lower end, which was passed as far as possible along the œsophagus of unopened bodies of recently deceased persons, the bodies being placed on their backs with their heads hanging down. In most cases I succeeded in reaching the great curvature. I held the entrance of the œsophagus open at the level of the cricoid cartilage by means of a pair of forceps, which rendered the introduction of the rod much easier. The body was now opened from the ensiform cartilage to the umbilicus and the position in which the rod lay was observed. The duodenum was then cut across, a short, thick glass cannula was tied in, and an indiarubber tube pushed over the latter was led out of the body. Above the cardia the stomach was completely closed by means of a ligature passed round it, encircling both the stomach and the rod. The stomach was then cleansed by rinsing. I now inserted several button sutures in the abdominal wall and closed the body, the india-rubber tube being led out between the button sutures. I next measured the capacity of the stomach by means of air at a pressure of 20 centimetres (eight inches) of water. The sutures were then untied and a quantity of thin plaster-of-Paris corresponding to the above-mentioned volume of air was poured into the empty stomach. The duodenum was now ligatured, the cannula removed, the abdomen again closed by sutures, and the body allowed to lie for from 16 to 24 hours. We do not in this way obtain exactly the natural position of the rod in the stomach, because it always has a tendency towards the posterior wall. When the stomach is filled with a mixture of plaster and water the lower end of the rod rises a little, in accordance with the laws of hydrostatics, because the brass tube containing air has a tendency to ascend in the heavy liquid. Nevertheless, I did not change it, though this might have been easily done by withdrawing the rod St with the piston-like end K. The thorax and abdomen were then opened and the lungs and heart were removed. The stomach with the tube R 2 embedded in plaster being left *in situ*, the rod with the tube R 1 was removed through the mouth, so that the stomach with the tube embedded in plaster could be afterwards taken away without interfering with the subject's throat. For every experiment I used a fresh tube R 2, but the rod and the tube R 1, of course, always remained the same. In most cases

FIG. 3.



Rod for exploring the stomach.

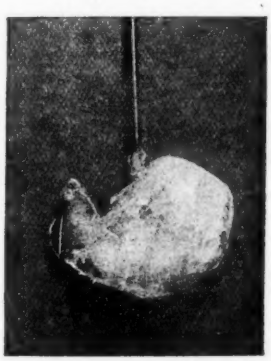
[3] Boas: Archiv für Verdauungskrankheiten, Band ii.

air or gas collects in the stomach, on which account a corresponding quantity of plaster has afterwards to be added. The stomach was at once placed in wadding saturated with a 4 per cent. solution of formalin and kept in it for two days, whereby the flexibility of its walls was preserved. The pylorus was then opened or else a small hole, which was afterwards sutured, was made so as to allow the escape of the air or gas and the introduction of thin plaster. In the next place the stomach was dried in a stove for several days, the stomach wall was removed from the plaster mould, and a cast was made by a model-maker. This was done by covering the mould with a layer of *papier-maché* about half a centimetre (a quarter of an inch) in thickness, the plaster-embedded tube being, of course, also enclosed. The *papier-maché* cast of the stomach was then cut into two halves, and I took care that the separation of the halves should correspond as exactly as possible to the frontal plane of the body. Two wooden boxes into which the *papier-maché* stomachs fitted were made and I thus obtained phantoms for practising gastroscopy.

In this way I ascertained exactly the position of the principal axis, so important for gastroscopy, as well as all the dimensions of the stomach which were required to be known, and I will now give a detailed description of some of the work done in the course of the investigation, accompanied by illustrations prepared from photographs of the models.

A.—A man, 23 years of age, whilst in a state of intoxication climbed over the fence of a railway and was caught by an engine. His arm and skull were fractured, from the effects of which he soon died. About 24 hours after his death I introduced the rod through the mouth of the body as deeply as possible into the stomach. The length of the body was 165 centimetres (five feet six inches), and the length from the umbilicus to the upper incisors was 57 centimetres (23 inches). The lower end of the rod was three fingers' breadth above the umbilicus. The portion of the rod within the body measured 51 centimetres (20 inches). The stomach lay under the liver partially filled with food with its great curvature where the upper third of the distance between the ensiform process and the umbilicus ended. The rod lay on the left side of the vertebral column, across which its lower end could only just be brought by pressing the head backwards with very great force. Fig. 4

FIG. 4.



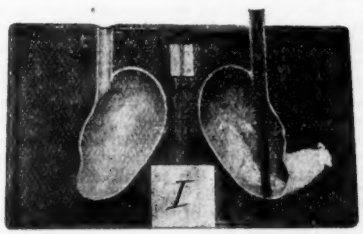
Stomach filled with plaster-of-Paris.

is a reproduction of a photograph of the stomach filled with plaster, including the plaster-embedded tube. The model represented a stomach of normal shape, such as is shown by Luschka in his Atlas. The following relations of parts were noticed and presented some points of interest. The tube touched the posterior wall of the stomach with its lower end. Between the tube and the pylorus the posterior wall showed an elevation corresponding to the vertebral column which would inevitably render it impossible to see anything of the posterior wall of the pyloric region by means of a straight gastroscope. From the middle of the tube to the middle of the pyloric part of the stomach the distance in the sagittal diameter was three centimetres (one and a quarter inches). Moreover, it will be seen from the illustration that the axis of the pyloric part of the stomach and the gastroscopic principal axis intersect one another outside the stomach. It is therefore obvious that the pyloric part can only be brought into view by the intervention of a second axis inclined at an angle to the principal axis. If a beak is therefore provided at an angle of 45° the window must find itself at a distance of about eight centimetres (three and a quarter inches). In the stomach the gastroscopic principal axis finds itself in a length of 15 centimetres (six inches). The great curvature lies three centimetres (one and a quarter inches) below the end of the rod. In the frontal plane perpendicular to the principal axis the greatest diameter measured 24 centimetres (nine and a half inches). In the sagittal plane passing through the tube embedded in the plaster the greatest diameter was nine centimetres from the principal axis, three centimetres from the back and six centimetres from the front wall. At the spot where the lower end of the rod touched the wall the diameter of the sagittal plane was six centimetres. The total capacity of the stomach was 1900 cubic centimetres (116 cubic inches). On the posterior wall of the stomach two impressions were seen here as in all other models. The one corresponded with the left kidney, the other corresponded with the vertebral column and was situated nearly where the vertical left part of the small curvature formed an angle with the more or less horizontal right part.

B.—The following three cases showed stomachs placed vertically, what are seen being the *papier-maché* models in their boxes with the lids off. The principal axis is marked by black lines.

CASE 1 (Fig. 5).—This was the stomach of a man, aged 30 years, who died from tuberculosis of the lungs. The end of the rod lay one finger's breadth below the umbilicus. The rod touched the posterior wall of the stomach on the left side of the vertebral column. By pressing strongly on the

FIG. 5.



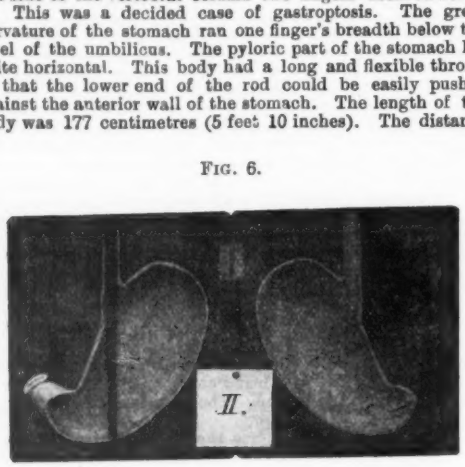
Model of stomach.

upper end of the rod its lower end could be raised towards the anterior wall of the stomach and lifted over the vertebral column, but on being released the rod immediately returned to its former position. The stomach was almost empty. The great curvature was at the level of the umbilicus, the small curvature at the pyloric part, almost horizontal, a little below the middle point between the ensiform process and the umbilicus. Posteriorly it ran almost parallel to the vertebral column. The length of the body was 164 centimetres (five feet six inches); the distance from the umbilicus to the upper incisors was 60 centimetres (23½ inches). The length of the rod within the body was 61 centimetres (24 inches). The distance of the umbilicus from the ensiform process was 18 centimetres (seven and a quarter inches). It will be seen from the model that the principal axis ran very near the posterior wall, for the section made through the axis showed the greater part of the stomach (on the right-hand side of the illustration) lying in front. It will, moreover, be seen that this plane even passed altogether behind the posterior wall of the pyloric part. A longitudinal axis drawn through the pylorus, however, intersected the principal axis, which was not the case with the normal stomach. The principal axis had in the stomach a vertical length of 17 centimetres (six and three-quarter inches). The greatest horizontal diameter passing through the pyloric region was 15 centimetres (six inches). The greatest diameter in the sagittal plane was 12 centimetres (four and three-quarter inches). This is about three centimetres deeper than the height of the cardia.

The longitudinal axis in the middle of the pyloric region ran three centimetres in front of the principal axis. The total capacity of the stomach was 1500 cubic centimetres (91½ cubic inches).

CASE 2 (Fig. 6).—This was the stomach of a man, aged 35 years, who died from tuberculosis of the lungs. The stomach contained only a little liquid. The rod lay on the left side of the vertebral column two fingers' breadth below it. This was a decided case of gastroptosis. The great curvature of the stomach ran one finger's breadth below the level of the umbilicus. The pyloric part of the stomach lay quite horizontal. This body had a long and flexible throat, so that the lower end of the rod could be easily pushed against the anterior wall of the stomach. The length of the body was 177 centimetres (5 feet 10 inches). The distance

FIG. 6.



Model of stomach.

of the umbilicus from the upper incisors was 58 centimetres (22¾ inches). The length of the rod within the body was 62½ centimetres (24½ inches). It will be seen from the model that the dimensions were exceedingly favourable for a straight gastroscope. A frontal plane through the principal axis even intersected the anterior wall of the pyloric part. The length of the vertical principal axis was 21 centimetres (eight and a half inches); the greatest diameter in the frontal plane vertical to the principal axis was 18 centimetres (seven and a quarter inches). This diameter touched the small curvature at the point where the left vertical part formed an angle with the right horizontal one. The greatest depth of the stomach in the sagittal plane was 12 centimetres (five inches) in the upper portion of the posterior part. The total capacity of the stomach was 1950 cubic centimetres (119 cubic inches).

CASE 3 (Fig. 7).—This was the stomach of a woman, aged 30 years, who died from tuberculosis of the lungs. It was decidedly gastroptotic and absolutely empty. The pyloric part was quite contracted and lay horizontally at the level of the umbilicus. When the stomach was inflated with air the

FIG. 7.

Model of stomach.

small curvature was one and a half fingers' breadth above the umbilicus. The rod lay on the left side of the vertebral column, its lower end being two and a half fingers' breadth below the umbilicus. It could be easily moved and could be raised from the posterior wall of the stomach and brought across the vertebral column. The length of the body was 160 centimetres (five feet four inches). The distance of the umbilicus from the upper incisors was 50 centimetres (20 inches). The length of the rod within the body was 55 centimetres (22 inches). A frontal plane drawn through the principal axis intersected the pyloric part at one centimetre below the axis lying in the middle of its longitudinal direction. The length of the principal axis in the stomach was 20 centimetres (eight inches). The greatest horizontal diameter, which also here touched the angle of the small curvature, was 16 centimetres (six and a half inches). The greatest depth of the stomach (in the sagittal plane) was 11 centimetres (four and a half inches) and was situated in the upper part of the posterior portion one centimetre below the level of the cardia. The total capacity of the stomach was 1800 cubic centimetres (110 cubic inches).

The principal results of these investigations were as follows:—

1. The pyloric part of the stomach lay above the vertebral column and was bent upwards towards the right side. On the other hand, the rod lay on the left side of the vertebral column, touching the posterior wall of the stomach. A longitudinal axis drawn through the pyloric part did not intersect the principal gastroscopic axis if the stomach was normal. It intersected this axis outside the stomach and ran in front of it, but in gastroptotic stomachs where the pylorus had sunk down and the pyloric part ran horizontally the principal axis and the pyloric axis intersected each other within the stomach. This, however, did not occur in all sunken stomachs; for instance, it was not found in cases of dilatation from ulcer of the pylorus or adhesions in the same place.

2. When the rod is inserted its lower end has, as a rule, very little freedom of movement either forwards or to the right side or to the left side; it can be easily moved only in its longitudinal axis. In all cases, however, where the neck is long and flexible, where the upper jaw is not prominent, and where the pharynx is sufficiently wide from the back of the mouth to the cricoid cartilage, the lower end of the rod can be moved to the requisite degree for the purpose of a straight gastroscope.

These conditions combined with a vertical position of the stomach would permit a sufficient inspection of it with a straight gastroscope, but in the living subject the conditions are not so favourable as in the model copied from the stomach of a dead body filled with plaster-of-Paris, for the living stomach when inflated is not immobile. What is, moreover, unfavourable for a straight gastroscope is that the distances changing at great intervals by the rotation cannot be compensated—e.g., one centimetre towards the back wall of the stomach, and after a rotation by 90° ten centimetres towards the pylorus. Except in the above cases a bent instrument is essential for gastroscopy. The point must form an angle of from 40° to 50° with the principal axis and the opening or window must of course be in the point. The principle adopted by Mikulicz is therefore proved to be absolutely correct. If, however, the window is fixed it will not be possible to inspect the whole of the stomach because that side which is opposite the window cannot be seen. The window must therefore be capable of rotation in the point. With such an apparatus the stomach can be thoroughly examined notwithstanding differences in shape. This form of the apparatus is also the least trying to the patient. The instrument has only to be moved and rotated in its longitudinal axis and does not require to be used like a lever, as a straight gastroscope does. The window can always be placed approximately opposite that part of the stomach which is to be examined, an arrangement which is evidently most favourable from the optical point of view. The instrument can be brought up to, or withdrawn from, both the anterior wall, the posterior wall, the right side, and the left side, and in this way two different views of the most important parts of the stomach may be obtained—either a general view at a distance or a close view showing details. I must not omit to mention that there are conditions which are scarcely accessible to gastroscopic examination, such as the rare abscesses and carcinomata which are limited to the pyloric ring, but these form a very small percentage of the cases concerned in gastroscopy, and even in them gastroscopy is of considerable use, for these conditions cause pains which are clinically most characteristic, and with a view to a surgical operation it is of the greatest importance to know that the morbid process is confined to the pylorus.

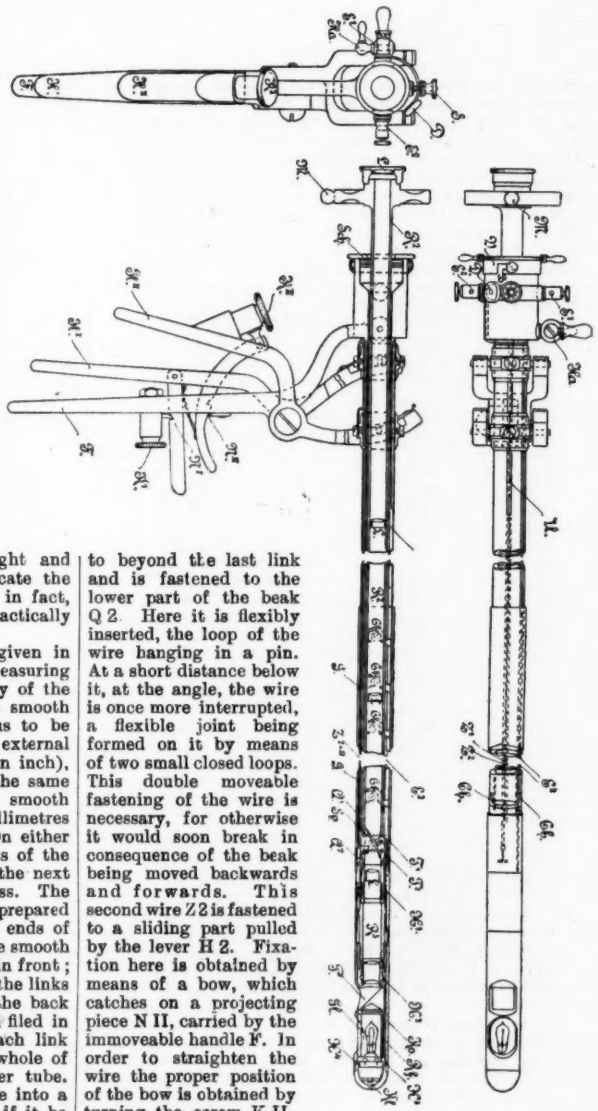
In constructing a gastroscope I began by modifying the

apparatus of Mikulicz, so that the incandescent lamp could be rotated to the right and the left together with the reflecting prism in the point. This instrument was rigid, and it is easy to understand that on account of its rigidity there was little difficulty in managing it. The introduction of rigid instruments into the stomach is, however, attended by conditions which will prevent the general adoption of such instruments, the principal reasons being the following. It is possible that the œsophagus may be perforated without great force being used. There are patients in whom a flexible bougie of the same dimensions as a rigid gastroscope can be passed, but who either cannot endure, or can only with difficulty endure, the passage of a straight rod or the straightening of an originally flexible tube. The cause of the difficulty may be a prominent upper jaw, or shortness of the tongue, or inflexibility of the parts at the level of the cricoid cartilage, or an unusual increase of the normal curvature of the vertebral column, or distortion of the œsophagus, or especially tuberculosis of the lungs. When a rigid instrument is introduced if an obstacle is encountered the operator is left in doubt as to whether the difficulty is due to faulty management of the instrument or to anatomical reasons. By a number of experiments upon dead bodies I have ascertained that the regions liable to perforation are at the level of the cricoid cartilage and the intersection of the left bronchus.

Every uncertainty and all risks resulting from it are avoided by using an instrument which is flexible while being inserted and is capable of being straightened after insertion. If the patient is placed in such a position that his œsophagus forms a straight line the straightening of the instrument must not cause him any pain, neither must it require the application of force by the medical man; if these conditions are not fulfilled the patient is not a suitable subject for this kind of examination and it will not be necessary to try a second time. In the great majority of cases, however, gastroscopy is possible. If required my apparatus can be used partly straight and partly bent and in this way will serve to indicate the position of an obstacle. I believe that I have, in fact, solved the problem of the construction of a practically useful gastroscope.

The instrument, of which various views are given in Fig. 8, consists principally of a flexible tube measuring 36 centimetres from the angle to the upper extremity of the apparatus. Here the tube is connected with the smooth rigid metal tube R 1, which enables the apparatus to be easily moved and rotated between the teeth. The external diameter of this tube is 14 millimetres (about half an inch), a size which is generally used. The links are of the same construction as in my œsophagoscope. They are smooth cylinders of 13 millimetres external diameter, 20 millimetres in length, and two millimetres thick in the wall. On either side of each link there is a flange half the thickness of the wall and fitting into a suitably prepared surface on the next link; the wall is also here filed to half its thickness. The flanges are fastened by means of rivets on these prepared surfaces, so that the hinges Ch are formed. The ends of the rivets are filed, so that the riveted parts are quite smooth both inside and out. The ends of the links are filed in front; at the back they are cut square across, and here the links touch each other when they are straightened. At the back of the links and on the outside there is a channel filed in which a wire runs, and little bridges soldered to each link prevent it from springing out of the channel. The whole of the flexible portion is covered with an indiarubber tube. The principle followed in changing the flexible tube into a straight rigid one is taken from the human finger if it be imagined to be hollow. The extensor tendon is here represented by the wire, traction on which is made by means of a lever. On the tube R 1 there is a moving piece to which the wire Z 1 is fastened. A rigid arm F is attached to the tube R 1, and when the lever H 1 is pressed against F it straightens the tube by pulling up the moving piece to which the wire Z 1 is fastened. When the tube is straightened a bow fixed to the lever H 1 catches on a projection N 1; the position of this projection on the arm F can be shifted by turning a screw K 1, and in this way the wire Z 1 can be tightened in the event of its becoming stretched by use. By releasing the bow from the projection N 1 the strain is taken off the wire and the tube at once becomes flexible. The wire Z 1 does not run along the whole length of the apparatus, but only as far as the last link and is soldered there (Q 1). At this last link a tube with a round top is attached by means of two hinges, one on either side. This tube is the beak of the apparatus and can be moved backwards and forwards through an angle of 135°. By the side of the first wire Z 1 a second wire Z 2 runs from the upper end of the apparatus to beyond the last link and is fastened to the lower part of the beak Q 2. Here it is flexibly inserted, the loop of the wire hanging in a pin. At a short distance below it, at the angle, the wire is once more interrupted, a flexible joint being formed on it by means of two small closed loops. This double moveable fastening of the wire is necessary, for otherwise it would soon break in consequence of the beak being moved backwards and forwards. This second wire Z 2 is fastened to a sliding part pulled by the lever H 2. Fixation here is obtained by means of a bow, which catches on a projecting piece N II, carried by the immoveable handle F. In order to straighten the wire the proper position of the bow is obtained by turning the screw K II. If the handles H 2 and F are pressed against each other the wire Z 2 is stretched, the flexible tube is straightened, and, moreover, the beak and the lower part are bent till they touch the last link of the tube. Then the angle in the position secured by the projecting piece N II is 135°.

FIG. 8.



Three views of the gastroscope.

Before introducing the apparatus it is of course bent into a curved form, the beak being made to take the same direction. It is now inserted so far that the angle between the

tube and the beak is below the cardia. If the wire Z 2 were now stretched immediately after the insertion the tip of the beak would touch the posterior wall of the stomach. In order to avoid this the wire Z 1 is first stretched, which straightens the tube as far as the angle, the beak remaining moveable. A rotation of 180° is now given to the whole apparatus in the body, and then by pressing the lever H 2 the beak is pulled towards the tube and fixed in a position at an angle. The tip of the beak now approaches the anterior wall of the stomach and finds an empty space to move in. The separation between the arrangements for straightening the œsophageal portion and for imparting an angular movement to the beak is an important feature of my apparatus. The first stage is the straightening and stiffening of the apparatus as far as the angle; in the second stage the apparatus thus straightened is rotated through 180°, and then the beak is moved through whatever angle is required for the inspection. This end is attained by stretching two parallel wires and by a rotation through 180°. In this way it seemed to me that the simplest and best solution of the problem would be arrived at. The length of the beak is about 10 centimetres (four inches). I might have divided it into two halves of five centimetres each, hinged together. In this case the wire Z 2 would have had to run beyond the hinges and the tube R 3 in the beak would have also had to be divided into two portions, but the rotation of the apparatus would have remained the same. I did not do this because the beak caused no difficulties in the insertion and the effect might have been to diminish the rigidity of the apparatus.

The beak consists of two exterior tubes. The lower tube, which is fastened by two hinges to the last link, runs from the angle for about five and a half centimetres (two and a quarter inches). To this is fastened a second tube containing the reflecting prism P and the incandescent lamp Gl. This tube is capable of rotation, but the other part, of course, is not. In order that the tube with the reflecting prism and the incandescent lamp may be easily rotated from outside the body it is screwed upon an inner tube R 3. This runs through the whole beak. After the apparatus is straightened and made rigid, an inflexible metal tube R 2, with a crown of toothed wheels T 1, is inserted into the flexible tube. This tube runs to the angle Q 2. Here its teeth gear into the teeth of the tube R 3. This tube R 3 can be rotated in the beak, and to it the lowest part of the beak containing the prism and the lamp is fastened. At the mouth of the tube R 2 there is a strengthening cone of hard indiarubber, behind which some slices of indiarubber are placed, both the cone and the slices fitting accurately into a hollow space of metal, closed by a cover V, which can be fixed by a bayonet catch B. To inflate the stomach with air a stop-cock Ha is provided, to which a pair of bellows can be connected. The air passes through the whole instrument and makes its way out beside the incandescent lamp through the end of the beak by a small valve Kl, which prevents mucus and liquid from getting into the apparatus. At the mouth of the tube R 2 there is a rotation disc, a button M on which serves as a mark for placing the reflecting prism P. The tube is always inserted so that the button M is in a line with the prism P, and as the rotations of the prism and the button correspond to one another the position of the prism in the stomach is always known.

The method of illumination and the arrangement of the optical part of the apparatus require a particular description. For conducting one portion of the electric current which starts from E 1, the whole flexible tube R 1, and the two tubes on the outside of the beak are used, and on arriving at the head of the apparatus the current passes into the lamp through a sliding contact X 4. The lamp, moreover, is fastened to an insulated lid. If the wire of the lamp breaks by burning all that has to be done is to screw off the end of the beak with the insulated lid in which the lamp is placed and to introduce a new lamp. The remaining portion of the current follows a more complicated course. As has been already said, at the back of the links there is a channel which serves for the reception of the two wires used as above described and at the bent side of the links, not far from the prepared surfaces, another channel is filed. In this second channel I have placed a small chain of German silver E 2, covered with silk which insulates it from the tube. The current now runs from E 2 in an insulated wire through the insulated German silver chain, which at the same time crosses the angle in a bridge, as far as the sliding contact X 1. Here the current passes over the tube R 3, which is the innermost tube passing through the beak; it carries a toothed wheel and upon it the outermost tube with the prism and the lamp is fastened. The tube R 3 consists of two parts, the one with the teeth being at the angle and the other one nearer to the extremity of the beak. One part is inserted into the other; both are insulated and the part lying towards the extremity of the beak R 3 is absolutely insulated from the outermost tube of the beak by rotating in ivory rings. The current now enters at H 1 into that part of R 3 which is completely insulated. At X 2 it then enters an insulated wire having at X 3 a sliding contact with the lamp. In order to be able to illuminate with interruptions the screw E 1 is inserted insulated. From here a bow D starts which is also insulated. The contact is effected by pressing or screwing the bow to the tube by means of the screw S.

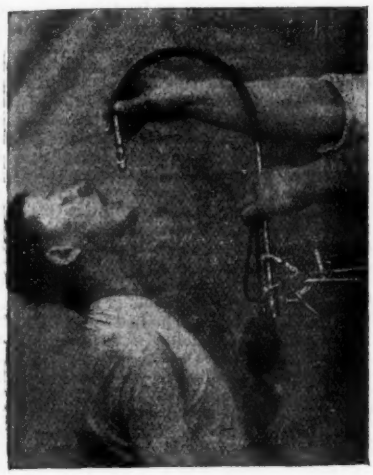
The action of the optical part of the apparatus is as follows. The light of the lamp is reflected by the silvered interior Rf of the tube, passes out though a circular aperture or window, and the rays reflected from the object which is to be examined are admitted into the tube R 3 through the prism P. Behind the prism there is a plano-convex lens of so short a focal distance that the image of the object is formed directly on the back of the lens. This is the best arrangement for obtaining a large field of view. The rays now pass along R 3 as far as the angle, where they are reflected by a metal mirror Sp axially to the tube R 2. This mirror is soldered to the exterior tube of the beak, which is furnished with hinges and fastened to the lowest link of R 1. The two interior tubes, R 2 and R 3, provided with toothed wheels (crown wheels) revolve round the mirror, the latter remaining stationary. The mirror being inclined at an obtuse angle (135°) the reflected image would be no longer circular, but would be oval, unless a strong biconvex lens, which makes the rays converge, were previously inserted. Behind the mirror there is a second biconvex lens, changing this image into an inverted, enlarged, and real one. This image is transformed by another biconvex lens into an inverted real image of the same size, which is finally changed by the eyepiece as by a magnifying glass into an enlarged virtual erect image. It has been already said that the rays are directed into the optical part of the apparatus by means of the totally reflecting prism P, and I have here made use of an artifice for the purpose of somewhat enlarging the field of view. As is well known a biconcave lens produces a diminished upright image, with a correspondingly enlarged field of view, and I have provided a substitute for such a lens by giving a concave figure to the front sides of the prism, the third side, which is moreover silvered, being the reflecting surface. These reflected rays now leave the prism through the convex surfaces. The curvatures of the concave and convex surfaces must not be exaggerated, because if so, the image will be distorted. To a certain extent the distortion is reduced by the stomach being, as it were, presented for inspection like the interior of a hollow ball.

The method of introducing the gastroscope may be explained in a few words. A simple preliminary trial, often without the use of cocaine, will suffice to show whether the examination will succeed easily with any given patient. The longest flexible œsophagoscope being passed into the stomach it can be straightened without any resistance if the patient is a suitable subject. If the sensitiveness of the patient's throat prevents this cocaine must be used for the examination.[4] A 10 per cent. solution is brushed on, the first parts to be treated being the palate and the base of the tongue, and then the back of the pharynx and the sinus pyriformis. The patient is then made to swallow and the brushing of the œsophagus is continued as far as the level of the cricoid cartilage. The gastroscope is made flexible and inserted exactly like my œsophagoscope. The patient is seated on the examination-table, as shown in Fig. 9. The insertion must be accomplished easily and without the use of any force. The apparatus in its flexible condition is inserted so far that the angle is below the cardia. The reflecting prism is turned towards the right side of the patient. The distance of the cardia must be previously ascertained, which can be done in several ways. If the patient contracts the muscles of his throat very much it is sometimes more convenient to introduce the apparatus whilst he is lying on his back with the upper part of his body raised and

[4] See Gattstein, Ueber Oesophagoscopie, Verhandlung Deutscher Naturforscher und Aerzte, No. 69, 1897, Theil II., Heft 2, p. 82.

his head a little bent backwards, his back and head being, of course, well supported in order to relax the muscles of the throat. When the apparatus is sufficiently far inserted the patient is placed horizontally with his head hanging freely backwards. The observer's assistant stands at the patient's left side with his left hand under the patient's neck supporting the head and his right hand on the forehead, pressing the head downwards. In this position, and in this position only, the apparatus is straightened as far as the angle by pressing the lever H 1. This straightening must be accomplished without using any force and without causing any pain to the patient. If these conditions are not fulfilled, a thing which very rarely happens, the examination must be abandoned and a second attempt need not be made. It has happened to me in cases where examination with the

FIG. 9.

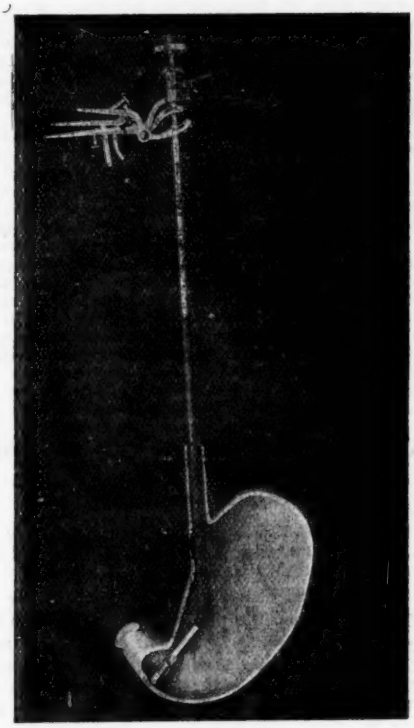


Introduction of the gastroscope.

œsophagoscope was of great importance that two prominent incisors were the only obstacle, and I have not hesitated to recommend their extraction by a dentist, for the operation causes little pain and the place of the missing teeth can be supplied by artificial ones. After the apparatus is straightened as far as the angle, the tube with the toothed wheel is cautiously inserted until it enters the lowest link but does not quite reach the angle. The apparatus is then rotated through 180°, and the lever H 2 is put in the latch, whereby the beak is directed forwards and fixed. The tube R 2 is then completely inserted and care must be taken that the button M, in a line with the reflecting prism, is on the left. The lid V with the bayonet catch B is now inserted and the stomach is inflated with air, the operator being guided by the sensations of the patient. It is of some use to blow a certain volume of air into the stomach with a syringe, its capacity being previously measured. The apparatus is then pushed as far as the great curvature, the distance of which has been ascertained beforehand by means of a bougie, and the proper length marked off on the gastroscope with a silk thread. The reflecting prism is now directed towards the pylorus and the beak towards the right and the pyloric region is first inspected. The beak is then brought into the middle and towards the left and in each position the prism is rotated 360°, the apparatus being at the same time gradually drawn back. The distance it may be drawn back each time depends of course on the size of the field of view and the observer must practise it on a model of the stomach. In this way the whole stomach can be methodically inspected in not more than three or four minutes and sometimes a single glance suffices to clear up the situation. The illumination must be stopped now and then. In order to become conversant with this part of the examination a preliminary trial should be made by holding the beak in the hand and illuminating for 10 or 15 minutes with intervals. After the examination is concluded the lid with the bayonet catch is unfastened and the toothed wheel tube is pulled back a little way. The lever H 2 is then released and the apparatus rotated through 180°. In the next place H 1 is disengaged, the toothed wheel tube is removed, and the whole apparatus is withdrawn in its flexible condition. If care be taken to proceed in this manner no accident can happen.

Of course the observer will test the condition of his apparatus before each examination. Although no particular strain is put upon it while in use it is at least conceivable that some part of it might give way. Either the wires or the hinges might break, their action being mutually antagonistic. The first of these accidents is of no consequence whatever. If the hinges break the lower flexible part can always be easily withdrawn by means of the wires and the indiarubber covering. The method of introduction and withdrawal already described shows that the rotation is effected by means only of the rigid toothed wheel tube and the wires. The lower part is in this way always flexible, both during introduction and withdrawal. The illustration (Fig. 10) is a reproduction of a photograph of the complete apparatus, inserted, as for the purpose of inspection, into a model (phantom) of the stomach. After having been used the apparatus is cleansed and rendered aseptic by wiping it

FIG. 10.



Inspection of the stomach.

with a cloth wet with a 5 per cent. solution of carbolic acid and finally it is wrapped in carbolised cloth.

Gastroscopy is indicated when there is a well-founded suspicion of the existence of a disease which cannot be cured by internal treatment, or which may even become worse under it, or which cannot be diagnosed with certainty by any other means. The indications are therefore the same as for exploratory laparotomy. As I have already said, gastroscopy will be of great use in the early diagnosis of carcinoma. When carcinoma exists it is desirable to know its extent with a view to an operation and gastroscopy will be available for this purpose if the information cannot be otherwise obtained.

Gastroscopy will also be of great use in watching cases that have been operated on and in detecting recurrence. Chronic incurable ulcers of the stomach may be examined with reference to the presence of carcinomatous degeneration, and the many cases of cicatricial stenoses in the pylorus may be investigated. The position of an ulcer in the stomach for which excision is contemplated may be ascertained. Hour-glass contraction of the stomach may be diagnosed with certainty, and chronic catarrh of the stomach with impairment of its motility may be distinguished from carcinoma. Ulcer and stenosis of the duodenum may also be distinguished from the corresponding morbid conditions in the stomach. Furthermore, gastroscopy enables a differential diagnosis to be made in a great number of abnormal states which simulate organic disease of the stomach; these are the so-called pseudo-diseases of the stomach (Oser), and are neuroses imitating the symptoms of ulcer, &c. A knowledge of the position of an ulcer of the stomach is sometimes of the utmost consequence for its surgical treatment, and exploratory laparotomy does not always answer the purpose, for inspection of the serous surface of the stomach is not decisive as to lesions in the interior. Finally, the rare cases of foreign bodies in the stomach, such as balls of hair and lumps of shellac, may be distinguished from tumours.

It is unquestionable that an experienced surgeon who knows upon what morbid process and upon what spot he must direct his attention will be more successful in gastroscopy than an inexperienced surgeon. Gastroscopy is no doubt the most difficult of endoscopic procedures. For proficiency much practice is essential and it does not suffice to make use of it only now and then. It is true that œsophagoscopy requires still more experience for the correct interpretation of the appearances observed. The best plan for a learner is to begin by practising with a model (phantom) of the stomach. The method of introducing the apparatus is in the next place learnt by trials on bodies of the recently deceased, the gastroscope being placed in an indiarubber tube closed at the bottom. Every opportunity should be taken of seeing pathological conditions in the recent state at operations. Whoever uses the apparatus must understand every detail of its mechanical construction and must be perfectly familiar with its management; he must also possess a delicate tactile sense for sounding, and must be able instantly to form an opinion regarding the appearances observed. I am confident that in a few years gastroscopy will gain ground, as œsophagoscopy has already done, and that excellent results will be obtained by well-trained specialists.

Dresden.

A CASE OF PERNICIOUS ANÆMIA TREATED BY ANTI-STREPTOCOCCIC SERUM.

BY WILLIAM ELDER, M.D., F.R.C.P. EDIN.,
PHYSICIAN TO LEITH HOSPITAL.

IN THE LANCET recently[1] Dr. William Hunter placed before the profession the results of his most recent investigations into the causes and symptoms of pernicious anæmia. The conclusions he has arrived at are best described in his own words as given in the last part of his paper.[2] Dr. Hunter states: "The definition I formulate for the disease is, then, the following. Pernicious anæmia, a chronic infective disease localised to the alimentary tract; *caused by* a definite infection of certain parts of the mucosa of the alimentary tract, chiefly of the stomach, occasionally also of the mouth and of the intestine. It is characterised by (1) intermittent destruction of blood and increasing anæmia (and all the other pathological and clinical changes consecutive to these—e.g., anæmia, lemon colour, urobilinuria, hæmorrhages, dyspnœa, palpitation, œdema), as the result of the absorption of poisons into the blood; (2) periodic disturbance of the alimentary tract, chiefly of the stomach and the intestine, as local effects of the infection on the alimentary canal; and (3) occasional 'toxæmic' attacks characterised by fever, sweatings, general nervous symptoms; not infrequently by effects—e.g., numbness, tingling, ataxia, absence of reflexes—denoting deeper nervous changes, such as peripheral neuritis, sclerosis of the cord."

I need hardly point out how important these conclusions are, if further investigations confirm them, for a successful treatment of the disease. The first part of Dr. Hunter's elaborate article appeared in THE LANCET of Jan. 27th, and it so happened that the following case was admitted to Leith Hospital under my charge on the same day. The reading of the first part of the article led me to begin the treatment of the case on the same lines as he suggested in the third part which appeared in THE LANCET of Feb. 10th. Briefly, that treatment consisted in the thorough cleansing of the mouth with antiseptic mouth-washes, the administration of internal antiseptics in the form of salol and salicylate of bismuth, and the injection of anti-streptococcic serum. For the notes of the case, as well as for the carrying out of the treatment, I am indebted to the house physician at Leith Hospital, Miss Edith Hudson, M.B. Edin.

A man, aged 35 years, was admitted to Leith Hospital on Jan. 27th, 1900, complaining of debility and breathlessness. The history of his present illness was as follows. About six months before (in July, 1899) the patient had a severe attack of sickness and diarrhœa, and since then he had felt that he was gradually getting weaker and he had had occasional attacks of sickness. About the end of the following November he had what he called a "chill," which seems to have been a slight feverish attack. After this left him he felt more debilitated than ever. It tired him to walk short distances and he began to be very breathless. About the first week in December he first noticed that his skin was of a pale yellow tinge and he became troubled with constipation. For a month or two before he came under treatment he had had very slight bleeding piles, but he had never lost much blood, only a streak having been detected very occasionally. He continued to work till three weeks before admission and was then forced to stop owing to his weakness. He attended at the hospital as an out-patient for ten days before his admission. He had not previously had any definite illness, but he occasionally suffered from pain along the costal margin on both sides which was, he said, very slight, and he sometimes had "bilious attacks." About 17 years ago he was troubled very much with bad teeth, had many gumboils, and had to get several teeth extracted. Since then his teeth had been bad and had troubled him much, but gumboils had not been so frequent. His mother, father, and the other members of the family were strong and healthy.

State on admission.—The patient was found to be a markedly anæmic man. His skin was of a lemon yellow colour. The palpebral conjunctiva and the mucous membrane of the mouth were very pale and the ocular conjunctiva was slightly yellow. He had a rigor shortly after admission, was breathing very rapidly, and was almost pulseless. The temperature was 100·8° F. The pulse improved after he was given an ounce of whisky and five minims of digitalis, and it was 124 about half an hour after admission. With regard to the hæmopoietic system the spleen was not enlarged. The blood was examined on Jan. 29th, two days after admission, and showed hæmoglobin 24 per cent., red corpuscles 797,500, and white corpuscles 4520. As to the integumentary system the skin had a soft velvety feel and was of a yellow lemon tint, except over the lower part of the back, where it was brownish in colour, the discolouration being diffused and not in circumscribed patches. With regard to the circulatory system he had palpitation and shortness of breath on exertion. If working with his head low he felt very giddy. He was occasionally troubled with tinnitus aurium. The cardiac impulse was neither visible nor palpable. On percussion the base was at the upper border of the third rib and the right border reached to the right edge of the sternum. The left border was three and a half inches from the mid-sternum. Auscultation detected nothing abnormal about the sounds. The pulse was 124 per minute; it was large, soft, and easily compressible. As to the alimentary system the tongue was pale, flabby, and indented by the teeth. The lips and the mucous membrane of the mouth were pale. Many of the teeth were in a state of decay and there were a number of carious stumps. The appetite was fairly good and the thirst was not increased. The patient sometimes suffered from pain along the left

[1] THE LANCET, Jan. 27th (p. 221), Feb. 3rd (p. 296) and 10th (p. 371), 1900.

[2] THE LANCET, Feb. 10th, 1900, p. 374.

costal margin and a burning sensation in the stomach. These sensations had no reference to food. The bowels were very constipated. The stomach was not enlarged. Liver dulness extended to about an inch above the costal margin. With reference to the nervous system, on rising after sitting for any length of time he felt giddy and his limbs were very tremulous when he walked. He complained of seeing dark specks before his eyes and occasionally he saw yellow and red lights floating in the air, the red being close before his eyes and the yellow at a distance. His temper was rather irritable. He had not been sleeping very well for some time. On ophthalmoscopic examination nothing abnormal could be seen in the retina. The respiratory system showed nothing abnormal. The specific gravity of the urine was 1020. The reaction was acid. There were no abnormal constituents and no indican.

Treatment and progress.—The patient was put on milk diet and was given a febrifuge mixture and half an ounce of whisky every six hours as a stimulant. On the evening of Jan. 27th the temperature reached 103·6° and the pulse was 120. On the 28th the temperature was 101° in the morning and 101·4° in the evening, and the pulse was 120. On the 29th the temperature was 100·8° and the pulse was 110. On the 30th he was very suspicious and it was very difficult to get him to take his medicines, as he thought that the medical attendants and the nurses were trying to poison him. The temperature on this day was 100° and the pulse was 108, and on the 31st the temperature was 99° and the pulse was 100. On Feb. 1st the temperature was down to normal and the pulse was 100. When the lights were turned down he became very excited; he jumped out of bed and was brought back after a great deal of persuasion. An attempt was made to give him bromide but he absolutely refused to take any drugs. He complained of being hungry, so he was given hot milk with 15 grains of sulphonal dissolved in it. He quieted down after a while and slept better than he had done for several nights. On the 3rd he was quieter and talked more sensibly He was put on convalescent diet. The following treatment was then begun. A powder consisting of five grains of salol and 15 grains of bismuth salicylate was ordered to be taken every six hours. Eight cubic centimetres of anti-streptococcic serum were injected into the subcutaneous tissue below the iliac crest. A mixture of one drachm of tincture of myrrh, 24 grains of carbolic acid, with six ounces of water was ordered as a mouth-wash. The patient's weight was 9 st. 1 lb. On the 5th eight cubic centimetres of anti-streptococcic serum were injected and on the 7th 10 cubic centimetres. An examination of the blood on this day showed hæmoglobin 44 per cent., red corpuscles 1,962,500, and white corpuscles 4700. On the 9th five cubic centimetres of anti-streptococcic serum were injected and the patient was allowed to be up. On the 11th his skin was seen to be not so yellow as it had been. He had lost about two and a half pounds in weight, now weighing 8 st. 12½ lb. The serum running short he had not an injection on this day as was intended. On the 13th 10 cubic centimetres of anti-streptococcic serum were injected and the examination of the blood showed hæmoglobin 66 per cent., red corpuscles 2,340,000, and white corpuscles 4500. 10 cubic centimetres of anti-streptococcic serum were again injected on the 15th and the same quantity again on the 17th, on which day the patient was taking his food well; he had been having very good nights. On the 19th he again received 10 cubic centimetres of anti-streptococcic serum. During the week the patient had lost one and a half pounds in weight and now weighed 8 st. 11 lb. On the 21st 10 cubic centimetres of anti-streptococcic serum were injected. He had been restless during the previous night and very wakeful, and 10 grains of trional were administered. On the 23rd 10 cubic centimetres of anti-streptococcic serum were injected. The blood was examined and showed hæmoglobin 66 per cent., red corpuscles 3,355,000, and white corpuscles 5100. On the 25th his weight was the same as that of a week ago. He was very costive and was therefore ordered a drachm of liquid extract of cascara sagrada to be taken at bedtime. On the 26th and 28th 10 cubic centimetres of anti-streptococcic serum were injected. The blood was examined on the latter day and showed hæmoglobin 90 per cent., red corpuscles 3,700,000, and white corpuscles 5100. On the night of March 2nd he was sleepless and very excited. He talked a lot of nonsense and said he felt as if he had very little blood in his body, and that the little blood he had was leaving him from the tips of the fingers, and so on. 15 grains of trional were given on the 3rd and he slept a little after its administration. He still weighed 8 st. 11 lb. 10 cubic centimetres of anti-streptococcic serum were given on the 4th. On the 6th, as he had been restless and wakeful during the night, he was given 15 grains of trional dissolved in hot milk, and 15 grains of trional were again given on the night of the 6th. 10 grains of anti-streptococcic serum were injected on the 8th. He had been quiet on the previous night and had slept well without any hypnotic. He talked of blood running up the back of his head and rushing down the bridge of his nose. His wife was asked if he had been quite sensible in his conversation when he was at home, and she said that after the beginning of his illness he used to imagine that all sorts of queer things were going on inside him. An examination of the blood on the 10th showed hæmoglobin 88 per cent., red blood corpuscles 4,360,000, and white corpuscles 4500. On the 12th it was found that he had gained two and a half pounds in weight during the previous week. He had been given 15 grains of bromide of potassium at midnight on the 11th. 10 cubic centimetres of anti-streptococcic serum were given on the 12th and again on the 15th, when he looked remarkably well, the skin having a perfectly healthy colour and appearance. He had another of his wakeful and excitable nights on the 18th and was again given 15 grains of bromide of potassium at 10 30 P.M. 10 cubic centimetres of anti-streptococcic serum were also injected. It should be said here that all the serum injections were given in the subcutaneous tissues covering the dorsum ilii. He had no constitutional symptoms after them. On several occasions the urine was examined and no trace of albumin was found. On the 20th an examination of the blood showed hæmoglobin 104 per cent. and red corpuscles 4,800,000. He had no anti-streptococcic serum injected after the 19th. On the 26th he continued to look and to feel well, and he slept very well. He still spoke, however, about queer sensations in different parts of his body, but his talk was more sensible.

The blood examinations were kindly made by Dr. J. S. Fowler, assistant physician to Leith Hospital, and the following are his reports on two examinations. The first describes the appearance of the blood on admission and the second its appearance on March 10th. "Jan. 29th.—Red corpuscles 797,500, leucocytes 4520, hæmoglobin 24 per cent. The red corpuscles show marked alterations; megalocytes are numerous and many of them have no central dell. On the whole the average diameter of the red corpuscles is above the normal. There are numerous poikilocytes as well as fairly well-marked polychromatophilia. There are a great many nucleated red corpuscles; by comparison with the number of leucocytes in the films they may be estimated at about 1088 per cubic millimetre. Typical normoblasts are comparatively few, the majority of the cells being of the megaloblastic type but somewhat smaller in size than usual. 31 per cent. of the nucleated reds are typical megaloblasts. A few nucleated reds show mitotic figures. The differential count of the leucocytes gives—large and small mono-nuclear 30 per cent., polymorpho-nuclear 66·5 per cent., eosinophile 3 per cent., myelocytes about 0·5 per cent. March 10th.—Red corpuscles 4,360,000, leucocytes 4500, hæmoglobin 88 per cent. The red corpuscles appear almost normal though some megalocytes are still present. Nucleated reds are exceedingly few, only one or two normoblasts being found. Leucocytes: large and small mono-nuclear 40 per cent., polymorpho-nuclear 55·5 per cent., eosinophiles 4 per cent., myelocytes about 0·5 per cent."

When one considers how unsatisfactory the treatment of cases of pernicious anæmia has been in the past I make no apology for thus early recording the results obtained in this interesting case. Dr. Hunter, who has done so much in his investigations on this disease carried on for many years, has arrived at the conclusion that the anæmia which is such a characteristic symptom is *only* a symptom and is a result of an infection of the alimentary tract. I do not at this time intend entering into a full discussion of the evidence which he has so ably brought forward in support of his conclusions, but this case is one which, apart altogether from the result of the treatment, might be used by him to further support his views. Dr. Hunter believes that the disease has its origin in the swallowing of pyogenic organisms which, when long continued, leads first to gastric or intestinal catarrh and, secondly, to a specific infection of the gastric or intestinal mucous membrane with, as a result, a hæmolysis in the portal circulation, so that all the

symptoms of pernicious anæmia show themselves. He suggests that probably the specific infection of the gastric mucous membrane is of "mixed" origin due to more than one organism, and that in most cases the primary source of the organism is to be found in the mouth associated, as a rule if not invariably, with bad teeth. Dr. Hunter also suggested that serum treatment might be tried, and as streptococci are found in a large proportion of cases of caries of the teeth, of stomatitis, and of gastritis, he intended trying treatment by anti-streptococcic serum.

There are some special points I would like to discuss in connexion with the case.

Diagnosis.—Was this a case of pernicious anæmia? To my mind there can be little doubt about the diagnosis. The patient had not been observed longer than a week before his admission, but his condition when admitted was so characteristic of pernicious anæmia that the disease was at once suggested to the minds of those who saw him. His pale lemon yellow colour at once indicated the marked anæmia which was present without apparently a sufficient cause. After careful questioning we could only get a history of blood-stained stools on one or two occasions which apparently came from a small hæmorrhoid. This loss of blood, however, should hardly be designated by the word "hæmorrhage," for it was trivial and at rare intervals. I only mention it in order to be absolutely accurate in the recording of the case. I am thoroughly satisfied that it had nothing whatever to do with his symptoms. In addition to the colour the other symptoms—breathlessness, general weakness, &c.—all pointed to marked anæmia, but when a microscopic examination of his blood was made the diagnosis became more certain. He was admitted on Jan. 27th and it was found that he had 797,500 red corpuscles per cubic millimetre instead of 5,000,000, that his hæmoglobin was 24 per cent. of normal, and that his leucocytes were 4520 per cubic millimetre. His corpuscles, besides, showed the characteristic appearances which are supposed to be associated with pernicious anæmia. Such profound anæmia is seldom found in men unless after severe hæmorrhages, and the fact that although the red corpuscles were reduced to less than a sixth of what they ought to be, whilst the hæmoglobin was only reduced about one-fourth of the normal with little reduction in the leucocytes, points strongly to the case being one of pernicious anæmia and not one of anæmia from loss of blood or such an anæmia as one sees in chlorosis. The microscopic appearances of the corpuscles were all typical of the disease. The progress of the case as regards the microscopic appearances of the blood points strongly in the same direction, because a marked characteristic which was brought out by all the examinations was the greater reduction in the red blood corpuscles than in the hæmoglobin, whilst the leucocytes remained practically the same. As the case improved the appearances of the corpuscles became less typical of the disease. His other symptoms tend to confirm the diagnosis. Marked features in the case were the nervous symptoms, chiefly evidenced in the sleeplessness, general irritability, and varying subjective sensations, which were chiefly referred to the abdominal region and digestive organs. Disturbances of the nervous system are often prominent symptoms in this disease. It was difficult to ascertain from his history how long he had shown these nervous symptoms and whether he might not have had some symptoms of mental or intellectual weakness before the onset of his anæmia. The patient was perhaps best described as being "slightly peculiar" at times, but this peculiarity was generally not at all well marked, though at other times it was quite evident. These symptoms did not improve in proportion to the improvement in the condition of the blood and this fact makes me a little doubtful as to whether they were all due to his disease and not rather to a slight mental degradation which he had had before the onset of his illness. The serum and other treatment I believe have no causal relation to those symptoms, as they were quite marked on his admission, and there was a history of them for at least some time previously. As regards the primary cause of the disease this case supports Hunter's views. The mouth and teeth could be described as in a state of neglect. A large number of teeth were carious and many were reduced to mere stumps, and he gave a distinct history of having had frequent gum-boils. The history of discharge of pus into the mouth extended back for many years. He had a history of occasional bilious attacks during the previous six months with pains referred to the costal margin, pointing to gastric disturbance, for some time before the onset of his anæmia, and he gave a history of having suffered from an attack of diarrhœa at the onset of his gastric symptoms. These gastric and intestinal disturbances are therefore also in accordance with Hunter's theory of the cause of the disease.

Treatment.—As regards the treatment of the case the details are sufficiently noted in the notes which I have already given. The treatment was begun on Feb. 3rd, exactly a week after the patient's admission into the hospital. His mouth was thoroughly washed and brushed with an antiseptic mouth-wash and he was given five grains of salol and 15 grains of salicylate of bismuth internally every six hours. 10 grains of anti-streptococcic serum were at first injected into the subcutaneous tissue over the dorsum ilii every second day. At the first two injections, on account of a fault in the syringe, he received only about eight cubic centimetres, but afterwards 10 cubic centimetres were given on each occasion except on Feb. 9th, when he got only five cubic centimetres. From Feb. 3rd till March 19th he received in all 18 injections of the serum and the antiseptic treatment was continued all through. With the exception of a hypnotic occasionally when his nervous symptoms required it and a dose of castor oil or cascara sagrada for his constipation this was the only medicinal treatment. He got none of the usual remedies for anæmia—neither iron nor arsenic nor bone-marrow. His blood was examined at intervals of about a week and the result is noted in the following table. The treatment, it should be said, began on Feb. 3rd.

Date.	Red corpuscles.	Hæmoglobin.	Leucocytes.
Jan. 29th	797 500	24 per cent.	4520
Feb. 7th	1,962,500	44 ,,	4700
,, 13th	2,340,000	66 ,,	4500
,, 23rd	3,356,000	66 ,,	5100
,, 28th	3,700,000	90 ,,	5100
March 10th	4,360,000	88 ,,	4500
,, 20th	4,800,000	104 ,,	—

On March 20th (52 days after his admission and 45 days after the commencement of treatment) his blood had practically reached normal.[3]

It would be a mistake to draw very decided conclusions from the results obtained by the serum treatment of one case, the more especially as cases of pernicious anæmia are so apt to be intermittent—a fact which almost every practitioner who has had experience of such cases must soon have noted. If a new method of treatment is adopted in those cases we are apt to think that the particular treatment has been the cause of the improvement. The hopes of the profession have been raised again and again with regard to this disease by the announcement of good results from particular forms of treatment. Arsenic and bone-marrow have probably hitherto given the best results, but although improvement has been derived from both forms of treatment in many cases such improvement has generally been only temporary and the disease as regards its ultimate result has been one of the most hopeless. Whether further experience of anti-streptococcic serum will confirm the result I have obtained in this case or not time alone will enable us to judge. That every case will be benefited by this treatment I can scarcely venture to hope, because the chances are that the disease, even if due to a specific infective affection of the gastric mucosa, may not always be due to the same species of organism and may, as suggested by Dr. Hunter, be owing to "mixed" infection. Judging from the results which have been obtained from the use of the anti-streptococcic serum in other conditions of blood infection and from what is recorded in the medical journals it must be concluded that this serum is not at all certain in its curative action. Whether this result is due to faulty serum placed upon the market or, as is more probable, to some cases of blood-poisoning being due to "mixed infection," or to there being

[3] On April 3rd an examination of his blood was made. The red corpuscles were found to be 4,325,000, hæmoglobin 104 per cent., and leucocytes 5600. On April 16th he was discharged from hospital and on April 22nd he reported himself as feeling fit and well and looked in very good health.

several species of streptococci producing a poison giving rise to similar symptoms but not counteracted by the administration of the anti-streptococcic serum in the market, further experience will show. The case recorded above is suggestive, and I believe this form of treatment is worthy of a further careful trial by those who have cases of pernicious anæmia under their care.

Leith.

ON CYSTS OF THE BREAST, THEIR RELATIVE FREQUENCY, DIAGNOSIS, AND TREATMENT.[1]

BY THOMAS BRYANT, F.R.C.S. ENG., M.CH. R.U.I.,
CONSULTING SURGEON TO GUY'S HOSPITAL; SURGEON EXTRAORDINARY TO THE QUEEN.

FOUR years ago, after having seen in consultation a very interesting series of cases of tumour of the breasts which had been considered to be examples of carcinoma but which eventually turned out to be cases of simple cysts, I was induced to write and subsequently to read a paper before this society upon the Diagnosis and Treatment of Early Cancer and Cysts of the Breast,[2] and I did so under the conviction that the frequency of cyst disease of this gland was not appreciated, that its diagnosis was not as perfect as it ought to be, and that the treatment of such cases was consequently uncertain and unsatisfactory. In that paper I quoted a dozen cases of simple cysts in the breast which had been suspected or pronounced to have been cancerous and which in the majority of instances would have been treated as such, and probably by the removal of the breast, when with a correct diagnosis the cyst itself was dissected out of the affected gland or otherwise destroyed, and the breast was saved in every instance.

The experience I have had since that date, with the attention I have given to the subject since my interest in it was awakened by the compilation of that paper, has led me to review as a whole my clinical experience of breast disease during recent years and particularly as to its bearing upon the frequency of the development of cyst disease of the gland, and I now bring before you in a condensed form the conclusions to which my investigations have brought me, of which the following are the most important: (1) that simple cysts of the breast are far more common than they are generally believed to be; (2) that they are chiefly found in women during the same period of life as that in which cancer is met with; (3) that they are mostly quite amenable to local treatment without the sacrifice of the breast-gland in which they are situated; and (4) that there is no reason to believe that women who have these cysts are more prone to cancer than those who have them not.

With the view of gaining some definite information as to the frequency of the presence of these cysts I have gone to my own note-books and have carefully noted and analysed 242 consecutive cases of breast disease as they have appeared before me in private practice, for I felt convinced that it was by such means alone that a correct impression as to the comparative frequency of the affection was to be acquired. The analysis of these 242 cases comes out as follows: 163 cases were registered as solid tumours or examples of cancer or sarcoma and 67 cases as of cystic disease. Of the 12 remaining cases eight were examples of adenomata, two were cases of lipomata developing in the parts covering the breast, and two were cases of carcinoma in men; but these 12 cases are not now under consideration. It will thus be seen that there are 230 cases of breast disease to deal with—163 of diagnosed cancer or sarcomatous disease and 67 of diagnosed cystic disease, the latter or cystic disease bearing to the former or cancerous disease the relative proportion of 29·1 to 70·9 per cent. These facts suggest the conclusion that out of every four cases of tumour of the breast, more or less simulating cancer, one at least will be of a cystic or simple nature.

But it will be said that there is some fallacy in this conclusion, since, in both groups, cases which have been only diagnosed are mixed with others in which the diagnosis was proved by operation; and the force of this objection I fully admit. Consequently to get rid of this source of fallacy I have eliminated from my calculation all the cases in both groups which were simply diagnosed and I now give an analysis of the cases of both groups which were subjected to proof by operation. By this method a like conclusion will have to be drawn, for it appears that out of the 163 cases of diagnosed cancer 126 were operated upon, and out of the 67 examples of diagnosed cyst disease 44 were operated upon, the total number of operations being 170, and these figures work out to show that of the whole number 25 8 per cent. were examples of cyst disease and 74·1 per cent. of cancerous disease, the proportion of cases being practically the same as in the larger figures, both series supporting the conclusion that out of every four cases of breast disease more or less simulating cancer one will prove to be an example of cyst disease. These figures consequently fully prove the truth of the first conclusion I have formulated—"that simple cyst disease of the breast is far more common than is generally believed."

I will now proceed to show you the truth of the second conclusion, "that these cases of cyst disease of the breast are found in women at the same period of life as that in which cancer is met with," and for this purpose have analysed all the cases which have presented themselves to me, 67 in all, 23 of which were in single and 44 in married women. The analysis is as follows:—

Age.	Cases operated upon.			Cases not operated on.			General total.
	Single.	Married.	Total.	Single.	Married.	Total.	
Under 30 years of age...	2	1	3	1	—	1	4
Between 31 and 40 ...	4	4	8	1	2	3	11
,, 41 ,, 50 ...	8	11	19	4	10	14	33
,, 51 ,, 60 ...	2	11	13	—	3	3	16
Over 60	1	—	1	—	2	2	3
Total	17	27	44	6	17	23	67

By this table it appears that out of 44 cases of cysts of the breast in which the diagnosis was confirmed by operation 11 occurred in women under 40 years of age and 33 in women over 40 years of age; and out of 23 cases diagnosed but not proved to be examples of the same affection four were under and 19 were over 40 years of age, the conclusion being that 52 of the whole number of 67 cases, or 77·5 per cent., took place in women over 40 years of age, the proportion in the group of cases which had been operated upon and in that in which the cases had been only diagnosed being about the same. These facts are enough for me to say that they afford ample proof of the second conclusion I have formulated, that these cases of cyst disease of the breast are found in women at the same period of life as that in which cancer is met with.

The third conclusion I have now to support is "that these simple cysts of the breast are mostly amenable to local treatment without the sacrifice of the breast gland in which they are situated," for by a free incision through the soft tissues which cover the cysts they can be exposed and emptied and by a simple dissection removed from the gland. Should the cyst when exposed present a lining membrane absolutely free from anything like papillary or other growths its excision is not, however, a necessity, for when its inner surface has been destroyed by swabbing it with either pure liquid carbolic acid, a strong solution of zinc chloride, or the tincture of iodine there is but little probability that any growth will subsequently appear. In my own practice I have had no instance in which this took place, although when any intra-cystic growth, however small, is found in the cyst wall the dissection of the cyst out of the gland should be adopted as a rule of practice. Indeed, when any suspicious growth is found to exist in a cyst, and such a growth is of a fleshy and not of a papillary nature, the lobe of the breast involved or the whole gland should be taken away according to circumstances, the latter course being probably the safer. But such cases as these have been

[1] A paper read before the Medical Society of London on April 23rd, 1900.

[2] Transactions of the Medical Society of London, 1896; THE LANCET, Feb. 8th, 1896, p. 343.

quite exceptional in my practice; there have been but two and these have been classed with the solid or cancerous tumours.

The practice I have just described is the one I have for many years always adopted, and I have not yet met with a case in which it has not been permanently successful. Under these circumstances the fourth or last conclusion has its best support, for my experience tends to show "that there is no reason to believe that women who have these cysts are more prone to cancer than those who have them not," and under such circumstances there can be no reason why a breast affected with this trouble should be sacrificed. A surgeon who may have removed a breast for supposed cancer and has found on or during its removal that the tumour was a cyst may soothe his conscience with the thought that he has, after all, done a good thing and saved his patient from future trouble. But this conclusion will have been based on the surgeon's hopes rather than his experience. In my belief the presence of a simple cyst in the breast is no harbinger of future evil if it be treated and removed, although if left it may without doubt become a source of mischief; and that should a cyst containing intra-cystic growths be left untreated it to a certainty will develop into a serious local affection, although when treated as I have advised the danger in the future seems to be small. I should like it, however, to be understood that I do not advocate the exploration of every cyst or of all tumours which may be cysts of the breast gland. Small involution cysts come and go, and particularly when the whole gland has been in a coarse, irritable, and painful condition and subsequently settles down; cysts of the size of a nut and even of a walnut occasionally disappear under an improved condition of health, and particularly of the pelvic organs when they have been disturbed. In the paper to which I have already drawn the attention of this society I recorded two cases in which this happy event took place, and it is doubtless such cases as these which, when they fall into the hands of quacks and undergo quack treatment, are regarded as examples of cancer and published as cancer cures. The cases upon which this paper is based were all examples of tumours as large as, or larger than, an unshelled walnut; each one had existed for some months and was the seat of local uneasiness, if not of pain. In the minds of their possessors they had excited fears, as well as in the minds of the medical men who had been consulted about them; in fact, all the cases were examples of breast disease which should justly claim the surgeon's close attention.

In some of the instances the lump in the breast existed alone, without any collateral symptom to help a diagnosis. In others a discharge from the nipple of some kind was present. In a few the patients reported that the tumour varied in size as well as in hardness at different times, and these symptoms should always lead the surgeon to suspect that the tumour might be a cyst. In exceptional cases there was some traction upon or retraction of the nipple, this condition tending to lead the surgeon towards a diagnosis of cancer, although it is quite consistent with the presence of a cyst. In none of the cases was there any dimpling or infiltration of the skin over the tumour as in cancer, although in several the skin was involved by stretching, and this in exceptional instances may be carried to the extent of its rupture. I have seen examples of this with rupture of the cyst and the discharge of its contents externally.

A serous cyst is sometimes met with in a breast which is as a whole undergoing involution changes. The gland thus affected feels on manipulation cordy, or as I prefer to describe it, as a "coarse" gland. The involution cysts when exposed by the incision into the breast appear as greenish or black spots of about the size of a hempseed in the substance of the gland; at times they appear in strings. Their appearance is well illustrated in Fig. 5, Plate viii., page 317, of my work on Diseases of the Breast.

The presence of these small cysts when associated with a simple serous cyst which calls for treatment does not require the removal of the breast gland, although hitherto surgeons have deemed it right to adopt this practice. I have followed their example in past years, but extended experience has confirmed me in the belief that it is not necessary, for the affected gland after the removal of the cyst has in all my cases so affected subsequently settled down without any future troubles manifesting themselves. In fact, the "coarse" breast, associated with a cyst, has settled down after operation just as well as the "coarse" breasts the subjects of involution without serous cysts have done, and generally do by time and treatment. The removal of the one is no more necessary than the removal of the other. When, however, intra-cystic growths are found to be present in the cyst which is being dealt with and the breast generally is full of small involution cysts the extirpation of the whole gland is a right measure to adopt.

It is foreign to my purpose to enter into the pathology of this affection, although since it occurs mostly in women over 40 years of age it seems probable that the cysts are originally involution cysts, and as it is very commonly associated with the occasional discharge of a more or less clear fluid from the nipple it seems justifiable to conclude that the ducts of the gland are in connexion with the cyst, if a dilated duct is not its origin. Some of these cysts, and roughly calculated less than half of those explored, will be found to contain small papillary growths attached to their walls. In one case these will appear like small red sessile buds of the size of mustard seeds; in another they will be pedunculated, whilst in exceptional cases the cyst will be found to contain solid growths. It seems probable, however, that all large cysts of the breast if left untreated will sooner or later become the seat of some proliferating intra-cystic growth, which will be papillomatous, sarcomatous, or carcinomatous in its nature according to the proclivity of the tissue to form or of the individual to develop either special variety; in my book on Diseases of the Breast I have quoted a series of cases to illustrate these points. The cases which I found in practice to contain solid growths have not been included in this communication, as they have been grouped with the solid sarcomatous or cancerous tumours.

Why these cases of cyst diseases of the breast are so frequently overlooked and left to be discovered by accident, is a question which may be difficult to answer. I believe it is so from two main causes, the first being, the strong belief that such cases are rare and are not, therefore, to be expected; and the second being the fact that these cases are met with in women at the same period of life as that in which cancer is known to appear. For it is true that the professional as well as the public mind is so firmly impressed with the idea that any tumour, not inflammatory, appearing in the breast of a woman over 40 years of age is probably cancerous as to forbid any other explanation of its nature being seriously entertained.

The facts I have laid before you clearly indicate that this opinion is not a correct one; for if we take all the cases of tumour of the breast together, excluding inflammatory affections but including the cases of carcinoma, presenting symptoms of so marked a character as to forbid any error in diagnosis being made, it has been shown in my analysis of cases that in one out of every four the tumour will be cystic and not cancerous; whereas if we eliminate all such well-marked examples of cancer from our consideration in which an error in diagnosis can hardly occur, and apply our argument to those alone of a doubtful nature in which there are no collateral symptoms of cancer to support a diagnosis, it does not appear to be wrong to conclude that in every two cases of this kind one will be cystic. I must confess that this conclusion came upon me somewhat as a surprise, but the facts I have laid before you clearly suggest no other, nor will they bear any other, interpretation. I do hope, therefore, that the professional mind will accept the truth as I now present it and in any individual case of breast tumour not clearly cancerous supply the argument of probability, and instead of assuming at once that the disease is probably cancerous remember that the logic of facts suggests that the case is as likely to be one of a simple cystic nature as of a malignant kind. In my practice it is certain that this has been the case. To admit that my experience in this matter is exceptional is what I cannot do; indeed, I know of nothing in my practice which differs from that of other consultants, although it is just possible that I may have been consulted more in difficult cases of breast disease than in those of cancer that are fairly evident, and if so I may therefore have had a larger proportion of cystic breast cases to deal with than other men. But I do not believe this to have been the case—nor do I think that such an explanation need alter materially the conclusions I have formulated, nor make them less worthy of your attention.

With respect to the diagnosis of these cases there may be a difficulty, and particularly in the case of a middle-aged woman with a hard, slow-growing lump in her breast, and in

whose history there is clearly an absence of the influence of lactation and of any inflammatory breast condition and the condition of the nipple and soft parts covering the lump are normal. In such a case as this the surgeon should put to himself the question, Is it one of cyst or is it one of early cancer? for the chances of either have been shown to be equal. To decide, or, rather, to help towards the diagnosis, a careful local examination should be made, with the patient placed flat upon a couch and the breast gland made to rest upon the ribs, when, should the surgeon's sense of touch be keen enough to detect an elasticity in the swelling or even fluctuation, the diagnosis of a cyst may reasonably be hazarded, although what the nature of the contents of the cyst may be cannot be otherwise than obscure. If a clear serous fluid can be made to flow from the nipple by manipulation of or pressure upon the tumour the probabilities of the cyst being a simple serous cyst are much enhanced. If the fluid be brown or blood-stained the existence of an intra-cystic growth of some kind may be suspected, and if the discharge be more like pure blood the presence of a soft solid growth, sarcomatous or carcinomatous, should be feared. When, however, there is no nipple discharge, as is often the case, and the other conditions are the same, the chances against the swelling being caused by a cyst are not lessened, although the view of the supposed cystic enlargement of the breast being due to the presence of some soft cancerous growth would be encouraged.

To make the diagnosis certain an exploratory incision should be undertaken, when if the lump be due to a cyst it should be dealt with as already described; and should the tumour be due to a cancerous infiltration or sarcomatous disease the breast gland should be removed; the operation being in these circumstances undertaken at the period of the tumour's growth after which the most favourable result may fairly be expected. To allow a cyst to enlarge and persist for months in order to make its diagnosis more certain is a timid and dangerous practice; and to allow a tumour which may be cancerous to drift until collateral symptoms have made their appearance so as to make its diagnosis certain is neglectful and culpable. For to the patient delay in removing the local disease, whether cystic or solid, is fraught with danger, whereas by early interference nothing but good can be achieved.

Grosvenor-street, W.

INVERSION OF THE MYOMATOUS UTERUS.

BY W. ROGER WILLIAMS, F.R.C.S. ENG.

I THINK it is seldom realised by those concerned in the teaching of pathology that of all non-malignant tumours uterine myomata are by far the commonest; thus of 5010 consecutive cases of non-malignant tumours of all parts of the body, in both sexes, I have found that no less than 883, or 17·6 per cent., were uterine myomata; and of 3886 females in this list 22·7 per cent. were affected with these tumours. It may be said that about 10 per cent. of all tumours in women are uterine myomata.

Of the various complications of myomata demanding surgical intervention inversion is one of the most urgent. It cannot be said that this condition has hitherto been studied with the attention that the important issues involved demand; and even in the best gynæcological treatises the subject is dealt with in a meagre and unsatisfactory manner. The forms of myomata prone to be complicated by inversion are submucous and intramural tumours, evolving towards the uterine cavity. The favourite seat of attachment for such tumours is the fundus or its vicinity. Myomata of this kind are usually sessile or they have only a short thick neck; even when this becomes somewhat elongated it generally remains thick and it is usually well supplied with blood-vessels, including one or more fairly large arterial branches. It is important to note that at its point of implantation the uterine wall is nearly always thinned from pressure atrophy, and this predisposes to inversion, of which a slight degree is nearly always present with tumours such as these. This form of the disease generally gives rise to severe symptoms, so that it is clinically important, although such tumours seldom attain large size. Exceptionally, however, large formations are met with. These tumours generally present as smooth, pyriform, ovoid, or rounded masses, the pyriform shape being the commonest with the attachment by the narrow end. They are softer, more muscular, and more vascular than their subperitoneal congeners but less prone to fibrous, calcareous, and cystic changes, while conglomerate forms are most exceptional. It is rare to find more than a single polypoid myoma within the uterine cavity, although with such a tumour intramural and subserous myomata may be associated. Hence success usually attends their removal.

The presence of a myoma within the uterine cavity acts like a foreign body—the uterus contracts and endeavours to expel it, becoming hypertrophied in the process ("*grossesse fibreuse*" of Guyon). Intermittent expulsive, labour-like pains result from this condition. The tumour is thus gradually forced downwards towards the cervical canal which it dilates, and it may even enter the vagina and be extruded from the vulva. Among the conditions favouring extrusion are congestion, œdema, septic infection, and other inflammatory complications, causing sudden increase in the size of the tumour, and many cases occur after parturition. In all these instances the determining factor generally is some injury sustained by the tumour during examination with the sound, tent, curette, finger-nail, &c. Lediard has reported a case in which the slight wounding of an intra-uterine myoma with the sound was soon followed by fatal septicæmia and this is by no means an exceptional occurrence. It is also to be noticed that salpingitis, hydro- and pyosalpinx are more likely to be associated with such tumours than with any other kind of uterine myoma.

Now, it is just these extruding myomata that are specially apt to be complicated by inversion of the uterus of which many instances have lately been recorded, and it is noteworthy that this condition may occur long after the climacteric.

In the mechanism of inversion two factors seem to me to be chiefly concerned: (1) thinning and weakening of the uterine wall at the seat of the tumour's implantation owing to pressure atrophy, which is the more marked the larger the tumour and *vice versâ;* and (2) contractions of the uterine musculature excited by prolapse of the tumour into the cavity of the organ, which is the chief cause of inversion with small tumours. The efficacy of these factors in any given case is inversely proportional. With large myomata the weight of the tumour dragging through its attachment on the weakened uterine wall is also an important factor. Here it may be mentioned that traction on extruding myomata readily causes inversion, and some cases are no doubt due to this cause. The facility with which this happens was long ago recognised by the celebrated American gynæcologist Emmet, who employed traction, producing inversion to facilitate the removal of these tumours. After a quarter of a century's oblivion this method has lately been revived as a great novelty. In gynæcology there is evidently some truth in the saying, "There is nothing new—except what has been forgotten."

The only other kind of uterine tumour besides myoma often complicated with inversion, is sarcoma, for cancerous growths hardly ever cause it. Sarcomata generally induce great softening of the uterine wall, often forming tumours which project into the uterine cavity, and it is these conditions which predispose to inversion; on the other hand the infiltration, contraction, and induration associated with the extension of cancerous growths are unfavourable to the production of this form of displacement. The almost invariable association of the neoplastic form of inversion, with marked softening and weakening of the fundus uteri, corroborates the view of Matthews Duncan as to the important part played by this condition of the fundus in the causation of post-partum inversion.

The inversion due to myomata may be of gradual or sudden production, most cases belonging to the latter category, when the tumours are generally inflamed, sloughy, or gangrenous, and the onset of the condition may then be attended by alarming hæmorrhage, as in Lawrence's case. Such cases may easily be mistaken for extruding myomata, the inversion being altogether overlooked. This is the more likely to happen since the union between tumour and uterus is in these cases generally very close. Mistakes of this kind may be obviated by digital examination per rectum when a hollow will be felt in the place of the dislocated organ, and a sound in the bladder readily comes in contact with the finger in the rectum.

It is worth noting—as the history of many cases shows—that the inverted myomatous uterus is remarkably tolerant of all kinds of operative procedures. This is fortunate, because for dealing with the condition tolerably extensive operations are generally necessary.

The removal of extruding myomata per vaginam is a very ancient procedure, and it is still the least dangerous and most successful of all the modes employed for the removal of myomatous tumours. In cases of inversion no other method need ever be employed, for even when the tumour, &c., is only partially extruded it is always accessible, and complete extrusion can readily be determined by traction, as Emmet long ago taught and practised. In my opinion abdominal section is never really necessary for the treatment of the inverted myomatous uterus, and I should like to see this principle more generally recognised than it is at present. By far the simplest and most conservative procedure, in suitable cases, is enucleation of the tumour with reposition of the inverted organ; this has been successfully done in a large number of cases—acute as well as chronic. Enucleation is adapted for the removal of nearly all tumours except sloughy and gangrenous ones and those that are of the largest size. Dr. Aust Lawrence has reported an interesting case in which the tumour having been successfully enucleated the displaced uterus soon afterwards underwent spontaneous re-inversion. His patient was a married nullipara, for many years subject to menorrhagia, who, eight months previously, suddenly "felt her womb come down." A week before coming under treatment a large tumour appeared at the vulva and this was accompanied by alarming hæmorrhage. On examination a myoma of the size of a man's fist was found outside the vulva—a long pedicle apparently connecting it with the top of the vagina. Realising that this pedicle was the completely inverted uterus, Lawrence was careful not to interfere with it in removing the tumour. Shortly afterwards the uterus was found to have undergone spontaneous re-inversion and the patient was soon restored to health.

Frazer Nash, Herman, Dow, and others have met with cases in which they have successfully replaced the inverted organ after enucleation of the offending myoma. This is a procedure that many years previously had often been successfully employed by Emmet. Watts has described an instance in which an inversion of 13 years' standing was successfully reduced after removal of the extruded tumour.

For the treatment of inversion with sloughing, gangrenous, or septically infected tumours, and with myomata of large size, the mere removal of the offending tumour is insufficient; and this is also the case when the inverted organ cannot be reduced, as not infrequently happens when there are inflammatory complications. In such cases more or less extensive portions of the inverted organ must be removed together with the tumour. In the first class of cases this is necessary because the morbid process quickly spreads from the tumour to the thinned and weakened uterine wall. Herman has described a case which strikingly illustrates the necessity for this mode of operating. His patient was a 2-para, aged 38 years, with a gangrenous tumour of the size of the fist projecting from the vulva. On examination it proved to be the inverted uterus with a gangrenous myoma attached to its fundus. The tumour was removed piecemeal with the curette and unsuccessful attempts were then made to reduce the inverted organ. The patient died the next day and at the necropsy it was found that death had resulted from perforation of the fundus by progressive gangrene.

As examples of the beneficial effects of the more radical procedure the following cases are of interest.

CASE 1.—Oliver's patient was a multiparous widow, aged 58 years, who had suffered for a fortnight from inversion, due to the presence of a small sessile, gangrenous tumour of the fundus. She had been subject to metrorrhagia for three months previously. The inverted organ protruded from the vulva as a sloughy mass. It was completely extirpated, together with the tumour, the ovaries being left. The patient soon recovered without a single bad symptom. The result would probably have been very different had the surgeon merely enucleated the gangrenous tumour. It is noteworthy in this and the following case that the complication supervened long after the climacteric.

CASE 2.—Péan has reported the case of Madame X——, aged 56 years, who had been subject to profuse metrorrhagia for several years. Her medical attendants, finding a big intra-uterine myoma dilating the os, seized it with forceps and endeavoured to draw it into the vagina. In so doing the tumour suddenly shot out from the vulva, carrying the inverted fundus uteri with it. Péan, who was called in at this juncture, clamped the inverted organ well above the tumour with long curved pressure forceps and then cut away the tumour with most of the inverted corpus uteri. The margins of the severed uterine walls were united with catgut sutures and the stump was then reduced without any difficulty. The patient made an excellent recovery.

CASE 3.—Horrocks has described a similar case with an equally satisfactory result, although the patient—a multipara, aged 45 years—was very weak and anæmic.

Many instances have been published in which operations of this kind have been done without the inversion being recognised, under the belief that only an extruding myoma was being dealt with. As an example of this condition Vanderlinden's case may be cited. His patient was an unmarried woman, aged 42 years, who had suffered for some time from uterine hæmorrhages and urinary troubles. On examination the vagina was found to be occupied by a tumour of the size of a child's head which caused marked protrusion of the hymen. In the process of its removal by *morcellement* a pedicle was reached. When this had been cut through it was seen to be hollow; and it was evidently the inverted uterus, as the peritoneum had been opened. The whole uterus was then extirpated, every part of it except the cervix being affected with myomata. Convalescence was delayed by rather severe septic symptoms, but eventually the patient recovered.

Mistakes of this kind—which are far from being uncommon—are far less dangerous than was formerly believed, when wounds of the peritoneum were regarded as almost necessarily mortal.

Clifton, Bristol.

STRYCHNINE AS A FACTOR IN CAUSING CEREBRAL HÆMORRHAGE.

BY LACHLAN GRANT, M.D., C.M. EDIN.,
MEDICAL OFFICER, GESTO HOSPITAL, ISLE OF SKYE.

A MAN whose arterial walls are healthy stands very little chance of being attacked with spontaneous cerebral hæmorrhage; but if his blood-vessels want their normal elasticity through their being affected with degenerative changes such as arterio-sclerosis or miliary aneurysms, he is liable to an apoplectic seizure from one of the weakened vessels giving way when it is subjected to any extra strain. This extra strain results from an increase of the blood-pressure, as when the individual is engaged in occupations involving a more than usual muscular exertion—for example, in lifting heavy weights, or in defecating, or from some mental excitement causing acceleration of the heart's action. Knowing this we quietly caution patients in whom we may suspect apoplexy against such exciting causes and against such stimulating agents as alcohol which increase the blood-pressure. The following case occurred whilst the patient was, of his own accord, taking a mixture containing strychnine, a drug which is known to have a powerful action in raising the pressure in the circulatory system.

The patient, a man aged 64 years, of apoplectic build, with atheromatous arteries, had been exposed to a great deal of hard tear and wear. Latterly he had been in the habit of dosing himself whenever he felt below par with the syrupus ferri phosphatis cum quinina et strychnina[1] (syn., Easton's syrup), generally taking it along with some bicarbonate of sodium, which gave him what he termed a "fizzing" drink. One morning he fortified himself with a larger dose than usual of the syrup and about an hour afterwards he began to feel uneasy, with giddiness and numbness in his extremities. He became quiet and drowsy and when I saw him two hours later symptoms of right-sided cerebral hæmorrhage were well marked. There was hemiplegia of the left side of the body, for when the left arm or leg was raised and allowed to drop it fell as if it belonged to a lifeless person. The limbs on the opposite side of the body had jerky movements which continued for half an hour; the hypoglossal nerve was involved as the tongue could not be put out straight, but deviated towards the paralysed side. The patient's face was of an ashen-grey

[1] Each drachm contains $\frac{1}{12}$nd of a grain of strychnine powder.

colour, the pupils were equal and moderately dilated, the pulse was 70 and was full and regular, the temperature was normal, the sphincters were relaxed, and the evacuations were passed involuntarily. The urine contained neither sugar nor albumin. Complete unconsciousness gradually developed, the respirations became stertorous, and on the second day the face became injected and the temperature reached 101° F., the pulse being 110. The fundi oculi were examined and appeared to be normal. There was little or no change until the fifth day, when the breathing assumed the Cheyne-Stokes rhythm, the coma deepened, the temperature reached 103°, and he succumbed without having regained consciousness. I was informed that a week previously to this fatal seizure he had premonitory symptoms, being attacked with headache, vertigo, and syncope.

When the action of strychnine is considered it is not unreasonable to suppose that in this case it was the actual exciting cause of the rupture. Strychnine increases the blood-pressure in several ways. It is a cardiac tonic, making stronger the contractions of the cardiac muscle. It is also a vaso-motor stimulant. Experiments have shown that strychnine is a great stimulant to the respiratory centre. Then it has a general tonic action, greatly increasing reflex sensibility and strengthening people generally,[2] so that the patient may be tempted to undue exertion and thus over-strain himself. It is also a gastric tonic, and, being one of the bitters, is hunger-producing, so that the patient may eat more and the overloaded viscera will also tend to raise the arterial tension. There is, however, another action of the drug which is dangerous—namely, that when strychnine has been taken for some time there may appear the so-called cumulative action,[3] when the full physiological effect of the drug may suddenly develop. It is, then, conceivable that if in this patient there was a cerebral vessel on the point of rupturing the strychnine might have so raised the pressure within the artery as to cause the weakened wall to give way.

From the above it is apparent that older patients should be warned against drugging themselves promiscuously with tonic syrups and tabloids containing preparations of the seeds of *strychnos nux vomica*, remedies which are largely sold by druggists nowadays. By comparison with other prescriptions it has been found that strychnine in the form of nux vomica is more used than any other drug whatever in this country.[4] It is evident, however, that great care should be taken in administering this stimulating drug to patients who have arrived at the degenerative age, and especially in all cases of cirrhotic Bright's disease, chronic gout, and syphilis, or where a patient has thickened and tortuous blood-vessels, or even where there has been an hereditary tendency to apoplexy. In many of these cases it should only be given when absolutely necessary, as in cardiac failure, to endeavour to tide the patient over his threatened dissolution.

Isle of Skye.

[2] Lauder Brunton: Action of Medicines, p. 282.
[3] Lauder Brunton: Materia Medica, vol. i., p. 42.
[4] Lauder Brunton: Action of Medicine, p. 282.

ON THE VALUE OF ABDOMINAL DISTENSION AS AN INDICATION FOR EXPLORATORY LAPAROTOMY IN INTESTINAL OBSTRUCTION.

BY JOHN J. WADDELOW, F.R.C.S. ENG.

A MAN, aged 54 years, who had hitherto enjoyed good health with the exception of some attacks of diarrhœa, was attacked suddenly with giddiness and an aching pain in the chest about midday on April 1st, 1900. After a time this passed off but there was a slight return in the evening. The bowels were opened on that day. At about 2.30 A.M. on April 2nd he was attacked with a violent pain under his right ribs over the gall-bladder which woke him. The paroxysms increased and caused him to sweat and writhe about. I was sent for and I saw him about 11 A.M. and administered a hypodermic injection of morphia and prescribed ten-minim doses of solution of morphia every four hours with a rhubarb mixture. The colic was accompanied by bilious vomiting. The pain subsided suddenly about 5 P.M. On the 3rd he was more comfortable but very sore and tender over the gall-bladder and discomfort was complained of in the umbilical region. The urine was bile-stained but there was no jaundice. On the 4th he complained of more pain about the umbilicus and the mixture was repeated. He was sick occasionally. On the 5th he was still sick and the tongue was becoming coated. Abdominal distension became marked, coils of intestine being visible through the skin. On the 6th, as the bowels had not been moved, I gave him a mixture of sulphate of magnesia, carbonate of magnesia, and peppermint water. In the evening fæcal vomiting set in. The pulse remained good all the time. On my arrival on the 7th the fæcal vomiting was more marked and the vomit contained some solid masses of fæces. He had had no sleep. The distension of the intestines remained the same. I gave a copious enema of soap-and-water and brought away some scybalous masses. Nothing was detected per rectum. I explained the gravity of the situation and said that I should come on the following day to perform laparotomy. On the 8th I went down prepared to open the abdomen, but finding the patient no worse and the distension unchanged I postponed operation and gave another copious enema. The tongue by this time had become dry and brown and the man assumed an anxious expression. The sickness had ceased on the 9th and a better night had been passed; the pain was less but the distension was unchanged. I injected about half-a-gallon of warm soap-and-water per rectum, and brought away some scybalous masses and there was a suspicion of flatus. This was the first passage of flatus since the illness began. The pain was less, there was no vomiting, and the patient slept well. On the following day he had a very copious pultaceous motion spontaneously and there was an abundance of flatus. This occurred four times during the day. The abdomen subsided and the patient felt much better. On the following day he began to eat a little solid food and the bowels acted naturally and since then he has made an uninterrupted recovery.

The great point of interest in the case is the spontaneous recovery after seven days of complete obstruction and two days of fæcal vomiting, and the important feature, to my mind, which prevented my operating was that suggested recently by Mr. W. H. Bennett—namely, the progress or not of the distension. As to the real cause of the obstruction I was in grave doubt. The onset of the case was undoubtedly biliary colic. The man was said to have been losing flesh for the last six months and the idea that the cause might be carcinoma either by itself or with the assistance of an impacted gall-stone suggested itself. I should think it highly improbable that a gall-stone of sufficient size to block the bowel by itself could pass through the various ducts, and the question of ulceration of a big stone into the duodenum seemed untenable considering the short duration of the attack. Lastly, was the obstruction due to the amount of morphia given to deaden the pain? If so, the effect must have lasted from April 5th to 10th, as he had no morphia after the 5th.

I feel quite convinced that if this man, instead of being in an out-of-the-way country cottage, had been under observation in a London hospital nine out of ten surgeons would have operated and with probably perfect justification in so doing. My delay in operating and the treatment I followed may be opened to criticism, but the end justified the means; and, moreover, a laparotomy in a country cottage is not to be undertaken as it is in a hospital with all appliances at hand and plenty of trained assistance, for in a country cottage, with the sole assistance of an anæsthetist and a respectable country matron not trained in matters surgical and sublimely ignorant of the principles of antiseptics, the difficulties and dangers are naturally enhanced.

Whittlesea.

GATESHEAD MEDICAL ASSOCIATION. — At the April meeting of the above association the honorary secretary was instructed to write to Mr. T. P. O'Connor, Mr. Lloyd George, and Sir George Pilkington, Members of Parliament, expressing the warm thanks of the association for their attitude of opposition to the registration of midwives and to the Bill at present before the House of Commons. Also to ask them to continue their opposition to the principle of the Bill and, failing its rejection at a later stage, to support the amendments of the British Medical Association. The secretary was also instructed to send a statement of the attitude of the association on this question to Mr. W. Allan, M.P. for Gateshead, also to Mr. Heywood Johnstone, M.P., and Mr. L. Atherley-Jones, M.P.

A Mirror OF HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

WESTMINSTER HOSPITAL.

A CASE OF DOUBLE OPTIC NEURITIS FROM SEROUS EFFUSION (QUINCKE'S DISEASE).

(Under the care of Dr. W. MURRELL.)

A SCHOOLBOY, aged seven years, was admitted into Westminster Hospital on Jan. 28th, 1900, the only history obtainable being that on the previous morning he had been brought home in a "fit" which lasted the greater part of the day. On admission he was perfectly sensible and talked freely but on being put to bed he passed into a condition of semi-consciousness which lasted for many days. He took no notice when spoken to and remained absolutely mute. The face and upper extremities exhibited choreiform movements of a slow and coarse type. These movements were apparently purposive in character and at times he endeavoured to clutch at objects within his reach. Sometimes the arms were widely extended and then slowly flexed as if performing the act of embracing. Sometimes the movements conveyed the idea that he was feebly endeavouring to strike those around him. There was no paralysis of the face or of the muscles of the limbs. The movements were, as a rule, bilateral, although sometimes the facial movements were unilateral, but not always on the same side. There was no rigidity of the muscles, retraction of the head, or opisthotonos. There was nothing to indicate that the patient suffered from headache, although at times the brows were contracted and the face wore a worried and anxious appearance. The bowels were open twice a day and urine and fæces were passed in bed. The motions were normal in character. The patient was unable to swallow and had to be fed by the nasal tube. There was no nystagmus, the pupils were normal in size and contracted well to light. There was well-marked double optic neuritis. The temperature was 99·8° F. and the pulse was 108. There was no tenderness or swelling of the joints and there was no rash on the skin. No tache cérébrale could be obtained. There was a little cough, but there was no expectoration. The breath and heart sounds were normal. The urine was acid, had a specific gravity of 1018, and contained neither albumin nor sugar. The spleen was not enlarged. The patient showed no signs of anæmia, but the blood was not examined. There was no wasting of the muscles and the knee-jerks were present, although somewhat sluggish. The tongue was clean and presented no sign of having been bitten. The patient would not protrude it voluntarily and it had to be examined with the spatula.

The condition of the patient remained practically unchanged for 12 days. The highest temperature recorded was on the second day, when it reached 100°; on the following day it was 99·8°, and from that time onwards it was normal. The double optic neuritis continued and the discs were observed to be getting paler. On Feb. 13th (the seventeenth day of the illness) the patient was much more sensible and recognised his mother, putting his arms round her neck. He was still unable to talk, although apparently he endeavoured to do so, from time to time uttering a few unintelligible words. On being asked if he would like an orange he nodded his head and he showed some signs of interest in a watch which was shown to him. The incontinence of urine and fæces continued but food was taken with less difficulty. The movements gradually subsided. On the 17th the patient could say his own name but beyond that could utter only inarticulate sounds and failed to recognise letters or words either written or printed. On the 20th he was able to speak plainly although incoherently. He endeavoured to get out of bed and during the night was so noisy that he had to be removed from the ward. Urine and fæces were still passed under him. On the 22nd he was quieter and for the first time indicated that he wanted the bed-pan. The optic neuritis was less marked. On March 1st the patient was able to get up and seemed to be quite well. On the 8th the following note was furnished by Mr. G. Hartridge who had frequently examined his eyes during the course of his illness: "Pupils five millimetres each. React well to light, to convergence, accommodation, and consensually. Right vision ⅔, left vision ⅔. Right disc getting white; not much swelling of the disc; edges clearing. Retinal vessels, especially veins, very full and tortuous. Left disc pale (less so than right), dim; edges blurred." The only medical treatment adopted was the administration for a few days of 15 minims of liquor arsenicalis three times a day.

Remarks by Dr. MURRELL.—This case presents many points of interest and it is easier to say what it is not than what it is. The facts on which we have to rely in making a diagnosis are the mental incapacity, with the peculiar movements, the incontinence of urine and fæces, the double optic neuritis, and the transitory elevation of temperature. The short duration of the fever, the absence of rash and of any characteristic symptoms exclude all the ordinary acute specific fevers. The possibility of its being enteric fever was considered, but although Drescháfeld and others have reported cases of apyrexial typhoid fever there was nothing to lead one to suppose that this particular case belonged to that category. The absence of spots, of the characteristic motions, and of any enlargement of the spleen was against it. It is true that the blood was not examined for Widal's reaction, but, on the other hand, optic neuritis is not common in enteric fever. Cases of acute rheumatism without joint affection are common enough in younger children, but the course of the temperature and the absence of tonsillitis and of cardiac complication are sufficient to exclude this condition. It was not pneumonia, for there was no dulness on percussion and the breath sounds were normal. It was not an example of status epilepticus, for even admitting that the initial seizure may have been epileptic in character, which was by no means clear, the patient had no epileptic attack during the time that he was in the hospital. Jacksonian epilepsy naturally suggested itself, but there was no history of an injury to the head and there was no specific history. Against the theory of chorea, which was at one time mooted, we have, apart from the fact that the movements were never strictly choreiform, the absence of any of the frequently associated conditions, rheumatism, tonsillitis, and carditis. Double optic neuritis has been reported in a few cases of chorea, but it is not common, and the association has probably been accidental. The idea of a cerebral tumour is worth considering, but although the patient had double optic neuritis and vomiting the latter was due to the administration of the arsenic, and it is not safe to diagnose cerebral tumours on one symptom alone. Had the patient been given a course of the iodides we might have thought that it was a syphilitic gumma or a periosteal growth, but he had no specific treatment. It may fairly be taken for granted that the double optic neuritis was the result of intracranial pressure. This was probably the result of an ependymitis causing a serous effusion into the ventricles analogous to the serous exudates in the pleura and synovial membranes. I regard it as a case of Quincke's disease—an angio-neurotic hydrocephalus. These cases are rare and are of considerable interest.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

Cystic Diseases of the Breast.—24 Years' Death Certificates in General Practice.

A MEETING of this society was held on April 23rd, Dr. F. T. ROBERTS, the President, being in the chair.

Mr. THOMAS BRYANT read a paper on the Relative Frequency of Cysts of the Breast, their Diagnosis and Treatment. This paper appears in full on p. 1201 of the present number of THE LANCET.—Dr. G. C. STEELE PERKINS agreed that the difficulty of diagnosing a simple tumour of the breast from carcinoma was often very great and he instanced two cases in his own experience which tended to support this view. The first case

was about to be operated on by the late Mr. Forster who gave it to his class as a typical example of mammary cancer. When, however, he incised the tumour pus escaped. The second case was one which occurred in his (Dr. Perkins's) private practice 17 years ago. A woman, about 38 years of age, without children, came to him with a lump in the breast. After careful examination he came to the conclusion that it was an innocent tumour which could be relieved by merely opening it and letting out its contents. A second opinion was, however, desired and Mr. Hutchinson was called in, and he without hesitation pronounced it to be cancer and advised immediate operation. When the tumour was incised pus flowed out. These two cases, he remarked, occurring in the experience of very able men showed how easy it was to make a mistake in diagnosis. In the second case there had been a history of injury nine months before which was followed by much pain. The nipple was unquestionably retracted but the tumour was only of about the size of a walnut and was hard.—Dr. H. CAMPBELL POPE observed that those in general practice saw these cases in their early stage and they had to make their diagnosis as best they could. Such cases often presented great difficulty in arriving at a diagnosis. Undoubtedly there was often a history of injury in cases which ultimately turned out to be carcinoma, a point to which Mr. Bryant had not referred. Mr. Bryant, moreover, had not said much about the significance of enlarged glands in establishing the diagnosis of carcinoma. Enlarged glands might be present when there was inflammatory mischief and thus might tend to confuse the diagnosis. Personally, he attached most importance to involvement and dimpling of the skin, especially the latter, which was often the first thing to direct attention to the fact that there was serious mischief in the breast. He agreed with Mr. Bryant in the probable proportion of innocent tumours in the breast and would be disposed to consider that it was even greater than 50 per cent.—Mr. BRYANT, in reply, pointed out that his paper did not profess to deal with cancer or abscesses of the breast but only with cysts of that organ. He remarked that Mr. Forster was a man who avowedly ignored the history, preferring to base his conclusions on what he himself saw. Such a method was very apt to lead them astray. The history of injury in Dr. Perkins's case might well have raised a doubt in the surgeon's mind as to the possibility of its not being cancer. He held that in the majority of these cases, if one utilised the information afforded by the history, one might arrive at a correct diagnosis. He had not referred to the significance of enlarged glands in establishing the diagnosis of cancer because he did not believe that fact had any significance, inasmuch as enlarged glands might be present independently of carcinoma; moreover, he was only dealing with doubtful cases. He admitted that the figures which he had brought together had surprised him, the more so as they were based on consecutive unselected cases. Cysts of the breast were looked upon as somewhat uncommon, but his figures showed the contrary to be the case.

Dr. H. CAMPBELL POPE read a paper on 24 Years' Death Certificates in General Practice. He commenced by remarking that whereas in hospital practice results of clinical work were tabulated, nearly the whole of the experience of general practitioners died with them, and thus an enormous waste of useful material took place. The series of deaths tabulated consisted of 595 cases; these consisted of the deaths actually occurring in the period exclusive of all inquest cases save one, a death under chloroform, which appeared under the heading "Pneumothorax." The series was divided as follows: carcinoma, 51 deaths; kidney diseases, 14; diseases of the lungs, 170; diseases of the heart and circulation, 46; scarlet fever, 9; typhoid fever, 4; diphtheria, 5; measles, 18; rheumatism, 11; diabetes, 8; senile decay, 8; influenza, 18; general tuberculosis, 2; tetanus, 2; hæmophilia, 2; liver diseases, 14; gout, 9; anæmia, 3; purpura, 1; debility and malnutrition, 62; diseases of the brain and nervous system, 69; extra-uterine gestation, 1; ovarian and uterine disease, 2; parturition, 8; hernia, 1; diseases of the digestive system, 42; erysipelas and septic diseases, 9; lymphadenoma, 1; bladder diseases, 5; and inflammation of the lower jaw, 1. The conclusions drawn were far different from those which had been anticipated at the commencement of the inquiry—namely, that the district of London (W.) concerned would seem to be more afflicted with respiratory diseases, especially bronchitis, than with anything else. Secondly, that infectious diseases were not very prevalent or fatal owing to the excellent arrangements made by the medical officer of health of Hammersmith and to the fine gravel subsoil. Thirdly, that cancer appeared more frequently than was supposed—1 in 12 of all deaths; that influenza was not a remarkably fatal disease; and that there was a lamentable and unnecessary waste of young human life.

HARVEIAN SOCIETY OF LONDON.

Removal of a Curtain Ring from the Pharynx of a Child.—Congenital Laryngeal Obstruction.—Cholesteatoma.—Exhibition of Cases.

A MEETING of this society was held on April 19th, Mr. PEYTON T. B. BEALE, Vice-President, being in the chair.

Dr. H. L. LACK showed a Curtain Ring which he had removed from the Pharynx of a Child, aged nine years. The ring was swallowed when the child was nine months old and produced violent fits of coughing and choking which soon passed off. For years the ring had caused no symptoms. The upper edge was free in the post-nasal space, the lower part lay free behind the arytenoids, while the two sides were firmly embedded beneath the mucous membrane of the lateral pharyngeal walls. The ring was cut through with bone forceps at its lowest part, opened out, and pulled upwards until free. Dr. Lack emphasised the importance of the coughing and choking attacks following a history of swallowing a foreign body, attention to which would lessen the number of these cases which had been overlooked.

Dr. C. H. MCILRAITH read notes of a case of Congenital Laryngeal Obstruction in which sudden death took place from laryngeal spasm (a specimen of the larynx was shown). The case was that of a female child, aged six months, who had been seen to be suffering from persistent respiratory stridor from the age of six weeks. There were no other cases in the family and no history of injury at birth or convulsions after. The child had, however, congenital syphilis. The stridor was entirely inspiratory, expiration being noiseless. It varied at different times both in character and in intensity. When the breathing was regular or superficial the stridor was diminished or absent. It was absent during sleep. It was increased when the child's breathing was irregular or deepened, as after crying, and also by changes of temperature, as on taking the child from a warm to a cold room and to a lesser degree from a cold to a warm room. There were no signs of obstruction. The mucous membrane of the nose and naso-pharynx was generally relaxed and there was some small amount of post-nasal adenoids present. On examination of the larynx the epiglottis was seen to be sharply folded and incurved on itself. The arytenoepiglottic folds seemed to extend from the tip of the epiglottis to the tips of the arytenoids as thinned bands, which were closely approximated to one another. Thus the upper aperture of the larynx was reduced to a narrow slit with two small openings, the one at the tip of the epiglottis and the other between the arytenoids. The thin folds seemed quite flaccid and flapped to and fro on respiration. There was some slight œdematous swelling over the arytenoids. The child died suddenly two months later, apparently from laryngeal spasm. A post-mortem examination had been obtained. The larynx gave appearances much the same as seen during life except that there were evidences of considerable relaxation of the mucous membrane over the arytenoids. The case was brought forward as one of interest on account of the comparative rarity of the disease, the possibly fatal issue, and as confirmatory by means of post-mortem evidence of the views put forward by Dr. G. A. Sutherland and Dr. Lack.[1] From the post-mortem appearances it was impossible to consider otherwise than that the stridor was purely mechanical, produced by the valvular action of the upper aperture of the larynx, depending partly on the peculiar malformation and partly on the flaccidity of these parts in infants. If post-nasal adenoids affected it at all it would only be by rendering the tissues more liable to relaxation and thus producing still more narrowing of the upper lumen of the glottis.—Dr. HERBERT TILLEY pointed out that Avellis (Frankfort) had stated that in some cases congenital laryngeal stridor was due to pressure on the trachea by an enlarged thymus

[1] THE LANCET, Sept. 11th, 1897, p. 653.

gland. The condition was (in such cases) at once relieved by removing portions of the gland or stitching it forward on the sternum or by performing tracheotomy and inserting a long tube which passed beyond the obstruction.—Dr. LACK said that the specimen was an extremely interesting one to him as it was a further proof of the correctness of the views which Dr. Sutherland and he had expressed as to the pathology of this disease, and quite fatal to the hypothesis of those who had ascribed the disease to adenoids.—Replying to Dr. TILLEY Dr. MCILRAITH stated that the thymus gland was of the usual size and that in a case of pressure on the trachea by an enlarged thymus which he had seen the character of the stridor was quite different and was both inspiratory and expiratory, chiefly expiratory.

Dr. HERBERT TILLEY showed a large Cholesteatoma removed from the Mastoid Antrum of a boy, aged 14 years. The main symptom was an intractable purulent discharge from the auditory meatus. On examination a small mass of granulation was seen at the inner end of the posterior meatal wall, through which a curved probe could be passed into a large cavity in the mastoid. The ordinary radical operation was performed and the whole mastoid bone was found to be hollowed out so that no cells existed, while posteriorly the situation of the lateral sinus was easily seen. The bridge of bone between the attic and the antrum was removed and the large cavity disinfected with pure carbolic acid and then packed with iodoform gauze, the wound being stitched up at the close of the operation. The patient made an uneventful recovery. These masses when freshly removed were of a pearly lustre externally and were made up of layers of epithelium so that they somewhat resembled an onion. Cholesterin crystals could be found in them and this, combined with the waxy nature of the epithelial layers, possibly accounted for the name given to the condition. Dr. Tilley could offer no satisfactory explanation of the pathogenesis of cholesteatomata.—Dr. ALFRED EDDOWES said he believed the change in the epithelium thrown off was waxy. He supposed the mother-of-pearl lustre was due to the same cause as in the case of the little pearl of milium in the skin. He was inclined to theorise that the changes taking place in the mastoid cells were slowly inflammatory, probably on account of the micro-organisms being checked in their growth by the accumulation of their products. The bacteriology of discharges from the ear and other orifices of the body was of great interest, as such discharges frequently set up and maintained skin eruptions.

Dr. SIDNEY PHILLIPS showed a case of a man suffering from Bradycardia. The pulse frequently fell to 30 and drugs had practically no effect on the rate.—The case was discussed by Dr. L. GUTHRIE, Dr. J. BROADBENT, and Mr. F. JAFFREY.

Mr. STANSFIELD COLLIER showed a case of Intra-Uterine Injury to the Skull and a case of Congenital Dislocation of the Hips.—Mr. PEYTON BEALE and Mr. EDMUND ROUGHTON discussed the cases.

Mr. HUBERT C. PHILLIPS showed a case of Hypospadias with complete Absence of Urethral Aperture. On the second day after birth Mr. Phillips made an incision at the apex of the glans penis and after some difficulty he succeeded in passing a probe into the urethra. The aperture was very small but would be enlarged later. There was absolutely no opening elsewhere in the urethra. Urine had passed normally since the operation.—Mr. JAFFREY considered this case one of the first degree as the corpus spongiosum was well developed and that only some slight plastic operation was necessary to relieve the binding down of the penis to the scrotum. As the meatus was very small dilatation would be beneficial.—In answer to Dr. EDDOWES Mr. PHILLIPS stated that there was no specific history in connexion with the case.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

Difficulties in the Administration of Fever Hospitals.

A MEETING of this society was held on April 13th, Dr. NEWSHOLME, the President, being in the chair.

Dr. E. W. GOODALL, medical superintendent of the Eastern Hospital of the Metropolitan Asylums Board, read a paper on Difficulties in the Administration of Fever Hospitals, which he divided into those arising with the public, the general practitioner, and the sanitary authority, and those incident to the special character of the hospital itself. These were becoming fewer every year as the hospitals became more popular and the ratio of admission to cases notified increased. But as they were used by a more intelligent and critical class the responsibilities became greater. One essential difference between these and other hospitals was that in these only could a patient be admitted or detained, especially after recovery, without his consent or that of his parents, while the prohibition of visits was often a cause of dissatisfaction, the majority of the patients being children. In most instances it was easy to explain the necessity for these restrictions, but a frequent and not unreasonable ground of complaints was the occurrence of "return cases," the contracting by the patient in hospital of other diseases than that for which he was admitted, or the recurrence of the same. To prevent return cases careful examinations should be made, nasal and pharyngeal, of every patient before discharge, and instructions issued to the parents as to symptoms of infectivity and of probable sequelæ. The difficulties with the medical profession arose almost exclusively from alleged errors of diagnosis, for the detention of a non-infectious case exposed the patient to risk of infection, while his prompt discharge discredited the practitioner in the patient's opinion. Dishonest notification deserved no consideration, but otherwise every allowance should be made for the difficulties incident to early diagnosis. Misunderstandings were most frequent in rural districts where the medical officer of health who attended the hospital was engaged also in private practice. Those with the sanitary authorities arose only when a hospital received cases from other districts, where different views were held as to the evidence of diphtheria, the period of detention in particular cases, &c. The most trying and responsible duties of the medical officer were, however, those connected with the management of the staff, and the appearance of infectious diseases other than those for which the patients had been admitted, especially if occurring just when they were about to be discharged. Much might be done by isolation and observation, though where the occupied beds were counted by hundreds such second infections would occur. Another and more embarrassing class of cases were those of diseases not received into the hospital. He admitted scarlet fever, diphtheria, and enteric fever, but apart from the few cases of measles sent in as scarlet fever through errors in diagnosis, measles, whooping-cough, and mumps broke out from time to time among patients already in hospital for a week or a fortnight; these were all diseases of long incubation and had doubtless been contracted by the patient before his admission, an accident that could not be avoided, though the spread of the disease to other patients might be prevented if the medical officer were informed of the existence of cases of such diseases in the same or adjacent houses, when he might put the patient in an observation ward for the requisite time. But it was not rare to find a case admitted with diphtheria develop scarlet fever some days, or even a week, later under circumstances excluding the supposition of infection in the hospital. Here two explanations were possible, either that the symptoms of the one masked for a time those of the other, or that the appearance of the latter was delayed by the former and its incubation period prolonged. Cases of diphtheria had communicated scarlet fever to others in the ward, the diseases having co-existed, but the angina had been concealed by the exudation and the rash had been absent. 80 such cases were admitted last year as diphtheria and a very few as scarlet fever only. To guard against such contingencies every fever hospital should be constructed with numerous small wards, not only for isolation and observation, but for the separation of different diseases, irrespectively of the ages of the patients; the greater cost was the sole difficulty in the way of carrying out this arrangement, but there was no advantage in providing separate hospitals for different fevers, for other diseases would always creep in. A large proportion of the patients were infested with pediculi on admission and the parents of clean children were naturally annoyed if they became infected. The best plan he had found to be that of cutting off the hair, ostensibly on account of the fever, to which no objection was made, and there was ample time for it to grow again before the child returned home. Lastly, there were the difficulties connected with the larger staffs and the stricter discipline requisite in fever hospitals than in others. The social ostracism from fear of infection deterred ladies

and it was not easy to obtain a sufficient number of really highly trained nurses. He found it best to keep up a full establishment, giving the nurses holidays during the slacker months, the necessity of which was evident when one considered that in some years no fewer than 25 per cent. were ill not so much from infectious diseases as from overwork.

Dr. W. G. WILLOUGHBY allowed parents to see their children through windows and to converse by telephone, and in consequence, perhaps, of this indulgence the admissions at Eastbourne were over 90 per cent. of the notifications.

Dr. MEREDITH RICHARDS was in the habit of keeping all new cases of scarlet fever at one end of the ward until time proved that they were incubating no other disease.

Dr. H. R. KENWOOD had printed instructions respecting continued infectivity and the occurrence of sequelæ given to the parents of every child discharged from the hospital at Finchley, where he was very lenient as to visits. In Stoke Newington he had dealt successfully with an unscrupulous notifier of alleged cases of diphtheria by referring them to the Asylums Board, until the frequent exposure of his misrepresentations at their hospitals compelled him to exercise more discretion.

Dr. W. A. BOND, Dr. E. GWYNN, Dr. O. FIELD, and others having taken part in the discussion, the PRESIDENT, referring to some of the points under discussion, said that as medical officer of health and hospital superintendent he learnt much respecting the origin of infectious outbreaks from the patients themselves and from the parents, &c., whom he saw at the Town Hall. When cases of doubtful tonsillitis were admitted he always gave a prophylactic dose of anti-diphtheritic serum. He had never found these cases contract scarlet fever in hospital; more often they had begun to desquamate when about to be discharged as cases of simple sore-throat. He believed that in many supposed to be post-scarlatinal the infection of diphtheria had been present from the first but its manifestation had been delayed, and, on the other hand, that some of Dr. Goodall's cases of post-diphtheritic scarlet fever had really been scarlet fever alone, the intensity of the angina simulating diphtheria; but he examined all throats alike, and if the Klebs-Loeffler bacillus were found in any scarlatinal case it was sent to the "mixed" ward.

Dr. GOODALL, in reply, expressed his belief that the danger of visiting had been exaggerated, though it was necessary to put some limits in hospitals with 500 beds. He required every visitor to put on a clean white cloak and used his own discretion in each case. He kept doubtful scarlet fever cases in isolation wards for three weeks, discharging them then if no desquamation appeared. There was absolutely no doubt as to the Klebs-Loeffler bacillus being the actual cause of diphtheria, though it might persist in the throat for months after recovery, alike in and out of hospital, and negative evidence was of no real value. He kept diphtheria cases from four to six weeks after convalescence. He had advised the Metropolitan Asylums Board to notify to the medical officer of health the return home of patients in their respective districts.

LIVERPOOL MEDICAL INSTITUTION.

Exhibition of Specimens.—The Use of Agglutination of Red Corpuscles for Diagnostic Purposes.

A MEETING of the Pathological and Microscopical Section of this institution was held on April 19th, Dr. T. B. GRIMSDALE being in the chair.

Mr. W. THELWALL THOMAS showed three specimens of Undescended Testicles removed for various causes. The first specimen, from a man aged 35 years, consisted of a rudimentary epididymis with radiating tubules in a flattened mass which caused great pain. The second specimen, an undeveloped testicle removed from a man aged 33 years, had herniated through a hole in the omentum, which in contracting had gripped the groove between the body of the epididymis to such a degree that the body of the testicle could not be drawn back again without lacerating the omentum. The patient complained of almost persistent painful chronic erections of the penis. The third specimen was removed in the course of an operation for radical cure of a large hernia complicating it. The sac of the hernia lay behind the complete tunica vaginalis in the groin, but owing to efforts to reduce the omental hernia a lacerated communication existed between the sac and tunica vaginalis and a hæmatocele existed. The patient was aged 50 years.

Mr. W. THELWALL THOMAS also showed a Fibroma removed from the Inguinal Canal of a woman, aged 56 years. Symptoms suggestive of strangulated hernia had led to its removal. The growth was of the size of a small hen's egg; it had a small cyst in its centre and was considered to be a fibrous thickening around a cyst of the peritoneum (processus of Nuck).

Mr. W. THELWALL THOMAS also showed a Cæcum, Vermiform Appendix, and Spermatic Cord and Testicle removed from a patient, aged 56 years, during an operation for radical cure of an irreducible hernia. Growths were found involving the cæcum and spermatic cord, and the whole was therefore removed. Microscopically the growths appeared to be fibrous and cellular but not carcinomatous. The patient made a good recovery.

Mr. KEITH W. MONSARRAT showed a case of Imperforate Septum at the Ileo-cæcal Junction illustrated by microscopic specimens and lantern slides.

Dr. HUBERT ARMSTRONG showed a specimen of Double Tongue, illustrated with microscopic and lantern slides.

Mr. R. W. MURRAY exhibited a specimen of Papilloma of the Larynx from a boy upon whom thyrotomy had been performed three times.

The CHAIRMAN showed a Papilloma of the Vagina removed from a woman aged 65 years. Two years previously a growth had been removed from the cervix uteri which was said to have been clinically very suspicious but was pronounced innocent by the microscopist. The present tumour had given rise to blood-stained discharge for about six months. It was a bright-red rounded swelling of about the size of a strawberry protruding through the vaginal orifice. In appearance it resembled an urethral caruncle. It bled easily on touch. It grew from the anterior vaginal wall close to the meatus urinarius but did not involve it.—Dr. R. J. M. BUCHANAN made the sections of the tumour which were shown.

Dr. W. GRAHAM showed a specimen of Innominate Aneurysm of the size of a Small Orange associated with Dilatation of the Aorta. The sac was intimately adherent to the inner end of the clavicle. The aortic valves were healthy but there was acute endocarditis of the tricuspid valves. The trachea was flattened, causing death from asphyxia. The specimen was from a man, aged 54 years, who had a syphilitic history.

Dr. W. GRAHAM also showed two cases of Dilatation of the Aorta associated with Aortic Regurgitation. In the first case the heart weighed 39 ounces. There was great thickening of the aortic valves and calcareous plates in the aorta. In the second case the aortic valves were affected with fusion of the anterior and right posterior cusps. The coronary arteries were narrowed with atheroma causing frequent and progressive attacks of angina pectoris, in one of which the patient died. Both cases were males, aged 52 years, and both had had syphilis before 30 years of age.

Dr. J. HAY showed five specimens of Atheromatous and Dilated Aortas. One was a rare example of marked dilatation of the ascending arch of the aorta associated with phthisis, the whole of the left upper and lower lobes forming one quiescent cavity. There was no aortic regurgitation and no hypertrophy of the heart. The patient, a woman, died at the age of 50 years from hæmoptysis. The second case presented, in addition to irregular dilatation of the ascending aorta, aneurysmal dilatation of each subclavian of the size of a walnut at the origin of the thyroid axis. There was no history of syphilis in either case. The other three cases were marked examples of dilatation of the aortic arch associated with regurgitation. There was a syphilitic history in two of these cases. The specimens were illustrated by numerous photographs.

Mr. G. P. NEWBOLT showed a case of Hydatids of the Liver.

Dr. J. R. LOGAN showed specimens of Muscle in Pseudo-hypertrophic Myopathy in the Early Stage, also Vermiform Casts of the Intestinal Mucous Membrane.

Dr. W. B. WARRINGTON, in continuation of previous studies on the relation existing between the function and structure of nerve cells, showed some Sections of the Spinal Cord: (1) chromatolysis in the anterior cornual cells after extradural section of the afferent roots in a puppy; and (2) chromatolysis in Clarke's cell column—(*a*) after section of the afferent roots, (*b*) after section of the cerebellar tracts, and (*c*) after complete section of the spinal cord.

Dr. C. A. HILL showed a series of Cultures of Bacteria producing sulphuretted hydrogen.

Dr. G. G. STOPFORD TAYLOR showed specimens of Monilethrix (hair), Trichorrhexis Nodosa, Leptothrix (hair), and Sclerodermа.

Dr. W. MURRAY CAIRNS showed a specimen of a Monster which had given rise to difficult labour necessitating evisceration.

Dr. A. S. F. GRÜNBAUM made a preliminary communication on the Use of Agglutination of Red Corpuscles for Diagnostic Purposes. After referring to the work of Bordet, Landsteiner, Shattock, and others, he pointed out that so far as his experiments at present went, while the serum from a case of typhoid fever (or a guinea-pig immunised against typhoid fever) would clump the corpuscles in blood from another disease, it did not clump the corpuscles from the same disease. The same held good for scarlet fever. The absence of reaction might be used as an aid to diagnosis and it was hoped that it would prove of more general application than the method of serum diagnosis described four years ago, since no bacteria were required. The observations were not yet complete and Dr. Grünbaum reserved to himself the further investigation of the subject.—In the discussion which followed Dr. W. B. WARRINGTON hoped that Dr. Grünbaum would be recognised as a pioneer in relation to this research, as he had been in the serum reaction for typhoid fever.—Dr. R. J. M. BUCHANAN asked Dr. Grünbaum if he had made any experiments to investigate whether the serum of an individual in normal health would clump the corpuscles from another healthy individual. He could not find any record of this having been done in recent communications on the subject of agglutination.—Dr. J. HAY and Dr. J. C. M. GIVEN also entered into the discussion and Dr. GRÜNBAUM replied.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF PATHOLOGY.

Polycoria.—Thyroidectomy.—Actinomycosis.—Spinal Dislocation.

A MEETING of this section was held on March 23rd, Professor A. C. O'SULLIVAN, the President, being in the chair.

Mr. ARTHUR BENSON showed a case of Congenital Polycoria in Both Eyes in a man, aged 40 years. In the right eye there were, in addition to the normal pupil, eight other openings, and in the left eye one extra opening in the iris. The openings were, for the most part, slit-like defects, through which the fundus could be illuminated. The man had also chronic glaucoma, for which (and not on account of the polycoria) he sought relief.

Dr. R. C. B. MAUNSELL showed the Right Lobe of a Thyroid Gland which he had removed from a girl, aged 18 years. A moderate uniform enlargement of both lobes had existed without marked symptoms for 18 months, but within the last month the right lobe rapidly enlarged and became tense, causing paroxysms of dyspnœa on exertion and stridor on deep inspiration. The specimen contained a very tense blood cyst as large as a goose egg. The growth was removed by Kocher's transverse curved incision, and the result was most satisfactory.

Dr. H. E. LITTLEDALE gave a report of a case of actinomycosis admitted into Sir Patrick Dun's Hospital, under the care of Professor E. H. Bennett, on March 8th, 1899, with swellings on the back of the neck and at the angle of the left jaw. There were several discharging sinuses as well as a fluctuating abscess which was opened subsequently and the pus from which was examined. Streptothrix threads, like convoluted chains of streptococci were found in the pus, but no clubs. There were no results from aerobic cultures; anaerobic cultures were not made. Microscopically the lesions were granulomata breaking down into pus which contained ring-like masses 0·15 of a millimetre in diameter, composed of streptothrix threads, but no clubs were present. The lung apices were also affected with the streptothrix and with tuberculosis, but tubercle bacilli, although found post mortem, could not be detected during life. The lungs were affected from the skin, as during life there was communication between the skin of the back and the right lung. There were no further lesions, except extensive amyloid change in all of the abdominal viscera. The patient died on Nov. 28th from prolonged suppuration, which all surgical treatment, such as scraping out the sinuses and irrigation, failed to control. The patient positively stated that, though in attendance on cattle, there was no disease of any kind in the cattle of the district.—The PRESIDENT said that he had examined the pus in this case microscopically and had discovered nothing in the way of clubs or threads. In the only other case which he had seen the clubs were very obvious structures. He thought it probable that there were various types of this organism and that this was not the type described in most text-books. In this case he tried cultivation twice, and in the first attempt nothing grew, while in the second almost everything grew.—Professor BENNETT said that the suppuration as presented to him clinically was unlike anything he had seen before, and the only loophole by way of exclusion was the suggestion of actinomycosis. There was another element in the diagnosis—namely, that the patient was a cattle-man, but he insisted, however, that none of the cattle in his district were ever known to have been diseased. Compound tincture of benzoin diluted with water was passed into the area between the scapulæ, and the diluted tincture, which could not be mistaken, was expectorated by the patient, so that there was no doubt in this case of communication with the thoracic cavity. The suppuration extended to both sides of the sacrum, to the very lowest attachment of the spinal muscles.—Dr. WALTER SMITH congratulated Professor Bennett on diagnosing the first case which had occurred in the human subject in Ireland. Considering that on the continent 40 or 50 cases had been recorded, its rarity in the United Kingdom was peculiar, and it was extremely unlikely that the disease could be overlooked.

Mr. R. B. MCCAUSLAND read notes of a case of Spinal Dislocation. A man, aged 50 years, previously healthy, except for bronchitis and asthma, was admitted to Dr. Steevens's Hospital, on Feb. 12th, having fallen a distance of 14 feet from a ladder on to his back and shoulders. On examination there were complete paralysis and anæsthesia and loss of the reflexes in the lower limbs; the abdomen was distended and tympanitic; respiration was diaphragmatic, inspiration short, and expiration lengthened. There was typical musculo-spinal paralysis on both sides, but the organs of sight, hearing, and smell were normal, and the tongue could be protruded. There was no difficulty in swallowing and there was no swelling or irregularity in the pharynx. Rotation and movement of the head from side to side caused no pain or crepitus. Examination of the back showed no irregularity or prominence or depression, and no crepitus could be heard over any of the vertebral spines. The upright position was most easy for the patient, as he became breathless and cyanotic on lying down. There was no priapism, emission of semen, or involuntary passage of urine or fæces. The urine, which was acid, had a specific gravity of 1022 and contained abundant lithates with a trace of albumin and phosphates. The treatment consisted in complete rest, easily-digested nourishment, an icebag to the spine, attention to the bladder and the rectum, and the administration of belladonna and ergot internally. The patient died 20 hours after the accident. The necropsy showed a dislocation forwards of the cervical vertebræ, with laceration of the cord and membranes. The bones were so locked that reduction would have been utterly impossible.

SOCIETY OF ANÆSTHETISTS.—A meeting of this society was held on April 6th, Dr. J. F. W. Silk, the President, being in the chair.—Dr. Percy Noble made a communication upon a case of Paralysis of the Respiratory Centre under Chloroform with recovery after the relief of intracranial pressure due to disease. The child, aged three and a half years, was suffering from basal meningitis and was operated upon on three occasions at short intervals. At the third operation he stopped breathing before the operation was commenced and no attempts to resuscitate him were successful, although the heart continued to beat regularly. The operation was then rapidly performed, a large quantity of cerebro-spinal fluid escaped, and the child quickly recovered consciousness. Death occurred four days later and at the post-mortem examination a small cyst was found in the third ventricle. Dr. Noble was of opinion that owing to the presence of this cyst "the dependent position of the child's head had produced undue pressure of the cerebro-spinal fluid upon the respiratory centre, which pressure was relieved when the cerebro-spinal fluid was

allowed to escape."—The President referred to a somewhat similar case in which death had occurred after a considerable interval following an operation for caries of the atlas and axis.—Mr. Edgar Willett read a paper on the Administration and Choice of Anæsthetics for Young Children. The limit of age for the cases to which he referred he fixed as being under six years, and he did not include cases of operations for adenoids. He thought that the general rule which laid down that patients under six and over 60 years should not have ether was too arbitrary as there were many exceptions. On the other hand, he had heard of cases where ether given to infants had been followed by severe bronchial and intestinal irritation. In his opinion chloroform alone did not give the best results in children. Among other objections to the use of ether was the terrifying aspect of the apparatus. In cases of cleft palate, &c., or eye operations he thought that chloroform was undoubtedly the best, but with these exceptions he thought that children under six years of age might advantageously be anæsthetised with a mixture of equal parts of chloroform and ether dropped on to lint or given by a Skinner's inhaler. Though this mixture was rather slower in its effects than pure chloroform the anæsthesia which ensued was on the whole most satisfactory; the colour remained good, the respirations were if anything quickened, recovery was rapid, and there was very little sickness. Another question raised by Mr. Willett was, Did shock ever occur from insufficient anæsthesia? Personally he did not think that it did.—Mr. H. C. Crouch thought that the feelings of the parents should always be considered and that every effort should be made to induce anæsthesia quietly. With regard to shock he cited cases in which it had appeared to him that death had occurred from insufficiently deep anæsthesia. He thought that chloroform produced less strain on the heart.—Mr. C. G. Burton said that the majority of the patients over two years of age who had been anæsthetised at the North-Eastern Hospital for Children were given A.C.E. and that the results were better than those from chloroform. He had never been able to attribute "shock after operation" to insufficient anæsthesia; in fact, he hardly believed in shock occurring in children from pain alone.—Mr. E. F. White thought that with the exception of cleft palate and similar cases ether was the best anæsthetic at all ages. He thought that "shock" was a very complicated phenomenon and that it occurred both with light and profound anæsthesia.—Dr. R. T. Bakewell had tried both ether and chloroform for young children, but on the whole he preferred chloroform. He thought it a drawback to ether that if there was much shock the anæsthetist had no stimulating anæsthetic to fall back upon. In short operations he thought that the degree of anæsthesia might be less profound than in longer operations.—Dr. W. J. McCardie always preferred to give ether wherever possible, very often commencing the inhalation with a small quantity of A.C.E. To children over four or five years of age he gave gas and ether, and recently he had given gas and oxygen even to small children.—Dr. Noble had used the mixture of equal parts of chloroform and ether with better results than with chloroform alone. He had not seen a case of shock due to insufficient anæsthesia.—Mr. Carter Braine had been very pleased with the A.C.E. mixture in these cases. Under two or three years of age he administered the mixture on a Skinner's frame, beyond that age he used a mask.—Dr. C. O. Fowler said that he had always been interested in this question, but had had some difficulty in obtaining an authoritative statement on the subject. He had tried both ether and A.C.E. but generally came back to chloroform. He thought that those who were sensitive to pain would also be sensitive to shock; sensibility to pain was a very variable factor.—Dr. Dudley Buxton thought that no rigid line of procedure should be adopted but that every case in which an anæsthetic was given to a child should be regarded as a separate problem. He considered that shock was an interference with the vaso-motor mechanism of the body. Chloroform also interfered with the vaso-motor mechanism. He did not think, therefore, that surgical shock could be prevented by profound chloroform anæsthesia, especially in children whose vaso-motor mechanism was extremely unstable. His experience was that children took ether and gas remarkably well and that A.C.E. was better for weakly children than chloroform. Chloroform was by no means absolutely safe for children, and if given it should be remembered that when anæsthesia had been induced very little more of the drug was necessary to maintain it.—Dr. Probyn-Williams thought that a complicated apparatus was not necessary for the administration of ether to young children, but he had found that it might well be given upon a small felt cone. In 1118 cases of anæsthetics given to children up to the age of six years at the London Hospital ether was given in 42 per cent., A.C.E. in 27 per cent., and chloroform in 31 per cent.—Mr. Grant Morris had used the mixture advocated by Mr. Willett for some years and was very pleased with the results. The children were less likely to pass into a condition of sleep and so it was easier to tell when the child was ready for operation.—The President agreed with the dictum that patients under six years of age did not take ether well. He thought that the question of "shock" was such an important one and so complicated as to be worthy of a longer discussion. As far as his experience went shock certainly did not depend upon light anæsthesia.—Mr. Willett, in reply, said that he thought that one advantage of the mixture he proposed was that the ether in it stimulated the breathing and the child did not merely go to sleep. When giving the mixture for operations on the eye he was prepared to add a little more chloroform if the patient was not sufficiently anæsthetised.

BRITISH GYNÆCOLOGICAL SOCIETY.—A meeting of this society was held on April 19th, Dr. W. J. Smyly, the President, being in the chair.—Mr. F. Bowreman Jessett showed the following specimens: 1. Two cases of Vaginal Hysterectomy for Carcinoma of the Cervix Uteri. 2. A case of Vaginal Hysterectomy for Myoma of the Uterus and Broad Ligament. 3. A case of Sub-peritoneal Hysterectomy for Myoma Uteri.—Dr. Macnaughton-Jones showed a specimen of Uterine Myoma removed by supra-vaginal hysterectomy, he also read the notes of a case of Hydro-salpinx and the pathological report on a specimen of Ovarian Sarcoma shown at the previous meeting.—The President showed three specimens of Uterine Myoma removed by pan-hysterectomy, two of them being removed by the abdominal route by Doyen's method and the other by vaginal hysterectomy.—In the discussion on the cases of myoma Dr. Frederick Edge (Wolverhampton) remarked that in view of the fact that some of these supposed myomata turned out to be in reality sarcomata he did not think that the leaving of the cervix was justified, especially since no one could tell beforehand whether the tumour would prove to be sarcomatous or not.—Dr. Macnaughton-Jones asked the President what he thought of the value of Doyen's angeiotribe. Inasmuch as Doyen's operation consisted essentially in the employment of this instrument he thought that it would be useful if every fellow of the society who might use it were to report its result. It was being much used in Vienna, Berlin, and some other places.—Dr. William Duncan said that up to the present time he had had 68 cases of intra-peritoneal hysterectomy, of which an account would be found in THE LANCET of April 21st. Of these patients four had died; but one of the fatal cases occurred suddenly from embolism when the patient had so far recovered that she was about to leave the hospital. This case could not therefore be attributed to the operation, and he might reckon his mortality at three in 68, or 4·4 per cent. He did not agree with Dr. Edge that they ought always to perform pan-hysterectomy, for in the vast majority of cases they had to do with a true myoma and not with a sarcoma; he preferred to leave the vagina unopened whenever that was possible.—Dr. Herbert Snow also took exception to Dr. Edge's views; the malignant degeneration of myomata was quite exceptional, occurring in certainly not more than 5 per cent. of cases. If the cervix alone were left he could not see that there could arise any danger from return of myomata; so it did not seem to him that the small risk of malignancy rendered it worth while to incur the increased risk of danger to the ureters involved in pan-hysterectomy.—After some remarks by Mr. Jessett the President said that by "Doyen's operation" he did not understand any one method of hæmostasis, but rather the plan of opening first the posterior vaginal vault and then drawing up the cervix, which would be found to shell out very easily from its bladder connexions. In this process the uterine arteries were separated from the cervix until they could be secured in the upper portions of the broad ligament where they were very small, instead of at the base of the broad ligament where they were large; moreover, they could then be secured close to the ovarian vessels, so that one ligature would suffice for both. He thought that if Dr. William Duncan could show a mortality of only three in 68 cases he might well adhere to his present plan of operating; for his own part, he had had very good results from pan-hysterectomy.—

A paper by Dr. Ralph Worrall, of Sydney, N.S.W., on Pregnancy complicated by Uterine Myoma and Ovarian Cyst was read.—Dr. Inglis Parsons read a paper on the Treatment of Cancer based on the Parasitic Theory. He pointed out that the mortality of cancer in England and Wales was still over 20,000 annually. Their present methods of treatment could not be considered satisfactory in the light of this fact. San Felice's discovery of a definite parasite opened up a possibility of treating the disease through the medium of the circulation, eradicating it entirely. The investigations of Pasteur done more than 20 years ago showed that the saccharomycetes could obtain everything required for their nourishment in the human body, while Schutzenberger had demonstrated that they could extract oxygen from the red corpuscles through a thin membrane. The human body, therefore, was quite a suitable habitation for these fungi, except that their main food, sugar, could only be obtained in small quantities. This served to explain the slow growth of the parasites as compared with their rapid growth in fermentation with abundance of sugar. He thought that the two methods of propagation, by budding and sporing, would explain the great variations observed in the periods of recurrence, because when spores were formed they might remain quiescent for years before commencing active growth. The rapidity of growth in cancer of the liver and in stout persons could be explained because the liver was the storehouse for sugar and in stout persons there was often an excess in the circulation which might even be found in the urine. They could now understand why the disease was more prevalent in the watersheds and along the courses of rivers, because the saccharomycetes flourished in moisture and damp atmosphere. Judging from Pasteur's work there was no toxin formed by the yeasts. This would account for the clinical symptoms of cancer being different from the microbic group of diseases; in fact, he considered that San Felice's statement explained nearly everything in connexion with the disease and was probably correct. He then indicated the lines on which treatment might be successful. Various bacilli were hostile to these fungi, and some toxin might be found which would kill them without doing harm to the cells of the body. Various drugs and salts destroyed these saccharomycetes; a selection of those that might be safely administered could be tried. As phagocytosis did not take place further knowledge might show us how to induce it. A diabetic diet, so as to reduce the sugar as much as possible, was worth trying.

KIDDERMINSTER MEDICAL SOCIETY.—A meeting of this society was held at the Kidderminster Infirmary on April 20th, Mr. J. Lionel Stretton, the President, being in the chair.—The President showed a specimen of Malignant Mass involving the Rectum and a Saccule of the Bladder which contained seven calculi. The patient, a man, aged 50 years, was admitted to hospital with symptoms of cystitis. On examining the abdomen the colon was found to be considerably dilated and malignant disease involving the bladder and the rectum was suspected. The bladder was washed out three times a day with weak nitrate of silver solution for two months with marked improvement. On March 31st uræmic symptoms developed and there was a constant discharge of blood from the urethra. The bladder was drained suprapubically under ether and three pints of saline solution were transfused. An opening into the saccule was discovered, but not explored, owing to the patient's grave condition. The patient rallied considerably after the operation, the uræmic symptoms abated, but death occurred from exhaustion five days later.—The President read notes of a case of Double Empyema in a young man, aged 20 years, who was admitted to hospital on Jan. 27th. He had had influenza followed by a large gluteal abscess, which was opened. On admission the patient was very thin and looked ill. There was a sinus in the left buttock which was discharging slightly. The house surgeon found nothing abnormal in the lungs. The sinus healed in a fortnight, and the patient was improving in health and was gaining weight. On March 7th on examination dulness was found at both bases posteriorly with absence of breath sounds and vocal fremitus and the exploring needle drew pus. On the following day the right side of the chest was drained by making two openings and threading a drainage-tube through; 16 ounces of pus escaped. Eight ounces of pus were removed at the same time from the left side with the aspirator. Five days later the left side was drained in a similar way to the right and 12 ounces of pus were removed. The patient was now making satisfactory progress. Mr. Stretton considered the case to be worthy of record on account of its rarity. A doubt having been expressed as to the wisdom of operating on both sides at once at the time of the first operation, he postponed the second operation for a few days, but in future cases he would not hesitate to operate on both sides at once.—Dr. O. C. P. Evans showed a girl, aged 18 months, on whom he had operated for Radical Cure of Hernia some three months ago. The child had a double inguinal hernia and the two operations were performed at the same time. The wounds healed by first intention and the child left the infirmary quite well three weeks after the operations and had had no return of the rupture since. No truss was worn.—The President read a very interesting paper on Details in Surgery and a discussion followed.

SOUTH-WEST LONDON MEDICAL SOCIETY.—A meeting of this society was held on April 11th, Dr. W. G. Dickinson, the President, being in the chair.—Dr. J. T. Richards showed a case of Persistent Branchial Cleft in a girl.—Mr. C. Ryall showed (1) a case of ovarian Tumour that had been removed, and (2) a patient having an Anus produced by the Trans-sacral Operation for the more Complete Removal of Malignant Growths of the Rectum and which appeared to be in a very satisfactory position.—Dr. R. H. Barkwell showed a Skiagram and read notes of a case of Recovery from a Bullet Wound of the Thorax without Operation.—A practical demonstration on the Production of Roentgen Rays was given by Mr. J. H. Gardiner, F.C.S., illustrating the production of cathode and Roentgen rays by means of a powerful induction coil and highly exhausted vacuum tubes. The different appearances of the discharge were shown, in air between a ball and point, in moderately exhausted vacuum tubes known as "Geissler tubes," and in highly exhausted Crookes's tubes. With an experimental tube in this latter state the cathode rays were shown to travel in straight lines from the surface of the cathode, to possess mechanical power, and to be capable of deflection by a magnet. The action of cathode rays in giving rise to Roentgen rays was explained and by means of diagrams the early forms of Crookes's tubes and the modification by Mr. Herbert Jackson of King's College, now exclusively used for the production of Roentgen rays, were illustrated. The effects of the rays were shown with the aid of a luminescent screen.—Mr. James Wimshurst, F.R.S., then showed his very beautiful "Influence" Machine, consisting essentially of a series of six pairs of circular glass plates with lead foil slips at intervals near their circumferences, rotated by hand, the plates of each pair in opposite directions. Very long sparks could be produced but the current appeared to be quite harmless and the hand could be placed in the line of discharge without injury. Using this machine instead of an induction coil and battery, with a modified Crookes's tube, Roentgen rays were produced of great power, with the advantage that the apparatus needed no preparation and the rays could be produced at any moment by merely turning the handle.—After the demonstration an opportunity was given for the examination by the aid of the rays of several cases of interest to the members.—A vote of thanks was accorded to the demonstrator.

BIRKENHEAD MEDICAL SOCIETY.—A meeting of this society was held on April 6th, Mr. S. H. Nazeby Harrington, the President, being in the chair.—Dr. Riddell read clinical notes on the following subjects: (1) Lead Poisoning; (2) Rupture of the Lung; (3) Acute Nephritis; and (4) Rupture of the Facial Artery.—Dr. R. Owen Morris read a paper on Dilatation of the Stomach, distinguishing a pathologically enlarged stomach (gastrectasia) from the large stomach (megalogastria) of gross feeders and those who lived on bulky food. The latter might exist without any functional fault or dyspeptic symptom, whereas in the former there was deranged activity as well as abnormal dimension. Although mention had been repeatedly made of dilated stomachs during the last 240 years, to Widman belonged the credit of remarking upon stenosis as a cause of gastric dilatation. In 1833 Duplay discussed the causation and symptoms of the disease; but not until Kussmaul first used the stomach-pump in 1867, and published his famous work in 1869, followed by Penzoldt in 1875, and in this country by Allbutt in 1887, in his paper published in the Transactions of the Medical Society of London, did the subject receive

universal attention from the profession and occupy a separate section in the text-books. After discussing the various classifications of the causes of the disease and enumerating the symptoms Dr. Morris said that the differential diagnosis of the cause of the dilatation was a matter of supreme importance both from the point of view of prognosis and of treatment—more especially of early surgical treatment. Very extensive dilatation was usually due to stenosis, but whether malignant or non-malignant must be determined by the presence or absence of hydrochloric acid, the presence or absence of a tumour and blood, the character of the pain, &c., whereas atonic dilatation was generally not so extensive. As to the treatment of the disease when fully developed Ewald stated that the practitioner should have two objects in view and these two comprehensive objects were clearly expressed by Burney Yeo under four heads—viz.: (1) to remove the decomposing residue of food and to cleanse the stomach; (2) to prevent putrid fermentation by antiseptics and by other means such as careful dieting; (3) to impart tone to the feeble muscular walls of the stomach, to promote gastric digestion, and to supply nourishment if necessary in other ways; and (4) to relieve constipation.

SHEFFIELD MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society was held on April 12th, the President, Dr. D. Burgess, being in the chair.—Dr. C. H. Cairns exhibited (1) an Anencephalus showing also Umbilical Hernia and Talipes Varus; (2) a case of Abnormality in the Distribution of the Tendons at the Wrist.—Mr. N. Milner read the notes of a case of Progressive Pernicious Anæmia in a boy, aged 12 years, and showed specimens.—Dr. Sinclair White showed a Myomatous Uterus.—Dr. R. Gordon read notes of a case of Cirrhosis of the Liver in an Infant, aged 14 months. He first saw the case last December, when slight enlargement of the liver was present. The liver increased in size until it could be felt below the umbilicus. In February ascites was present and on April 2nd it was necessary to tap, when five pints of clear, straw-coloured fluid were withdrawn. On the following day the liver was found to be considerably contracted, the edge being felt beneath the ribs. The spleen was not enlarged and there was no jaundice. The fluid was now collecting again, and the present condition was such that the child could not live much longer. The parents were both healthy and there was no history of alcoholism or syphilis. There had been four children; the first child suffered from curvature of the spine, the second was healthy, the third suffered similarly to the patient in the present case, and the illness pursued a similar course and ended fatally in about six months, post-mortem examination revealing cirrhosis of the liver. These children were reared in different parts of Sheffield and the last-mentioned patient was brought up entirely on sterilised milk for six months. Having, after careful examination, excluded alcoholism and syphilis, it was difficult to assign a cause for the cirrhosis in these cases.—Dr. Arthur Hall read a paper on Hysteria in Boys. A short account of six well-marked cases was given, in all of which, during some part or other of their existence, the diagnosis of cerebral or cerebellar organic disease was made. In the different cases cerebral injury, tumour, or meningitis were simulated and the persistency with which symptoms were kept up day after day and week after week was quite surprising. Unhappiness in surroundings either at school or at work was the common factor and a slight injury or illness was the immediate starting-point. The diagnosis and exposure of the true condition by no means removed the symptoms at once.

FORFARSHIRE MEDICAL ASSOCIATION.—An ordinary meeting of this association was held on April 6th in the University College, Dundee, Dr. C. Templeman, the Vice-President, being in the chair.—Professor D. MacEwan showed a Private of the Royal Highlanders who was suffering from the effects of a Mauser Bullet-wound received at Magersfontein. The wound of entrance was to the right of the seventh cervical vertebra and the wound of exit was between the tenth and eleventh ribs on the right side. There were some wasting of the scapular muscles, the right trapezius, the supra- and infra-spinatus muscles, some anæsthesia over the right shoulder, and also some difficulty in deep breathing, with slight cough.—Professor Kynoch showed: (1) Two Multilocular Ovarian Cysts removed by Abdominal Section; (2) a Papillomatous Ovarian Cyst of the size of a child's head, causing retention of urine, which was removed by section through the post-vaginal fornix; (3) a Uterus with a Calcified Fibroid in the Anterior Wall simulating vesical calculus which was removed by vaginal hysterectomy; and (4) an Adeno-carcinoma of the Body of the Uterus which was removed by vaginal hysterectomy.—Dr. J. S. Y. Rogers read the notes of a case of Labour complicated by a Dermoid Cyst. He dealt with the difficulty experienced in this case and the prognosis.—Dr. R. C. Buist read further notes of the case and the treatment adopted—namely, the removal of the cyst after delivery. He showed the cyst and made some remarks on the specimen.—Mr. Steele Moon and Professor Kynoch spoke on the case.—Dr. Rogers briefly replied.—Dr. C. Templeman gave a short summary of the 70 cases of Typhus Fever which he had had under his care in the Fever Hospital during the last two years. Dealing first with the ages, 21 patients were between five and ten years of age. There was none between the ages of 15 and 20 years, and only one above 60 years of age. The time of the year when most cases occurred was next referred to. The incubation period in a large number of cases was longer than 12 days. The clinical features and the worst complications which occurred were next dealt with.—Mr. Steele Moon, Professor Kynoch, and Dr. Husband (of Rajpootana, India) spoke on the paper.—Dr. Templeman replied.

ÆSCULAPIAN SOCIETY OF LONDON.—A meeting of this society was held on April 20th, Mr. A. W. Galloway, the President, being in the chair.—Mr. O. A. Wickham read a paper in which he advocated the Rotation of the Head by Forceps in Persisting Occipito-Posterior Positions when the head had reached the pelvic floor, then removal of the forceps, and their re-application as to a first or second vertex and traction.—Mr. W. Campbell M'Donnell reported an uncommon Cranio-thorax Relation. The child's back lay on the edge at the mother's left, the occiput at the right, the nose at the left pelvis, and the anterior fontanelle at the left. The maximum intensity of the heart-sounds were five centimetres to the left of the mid-pubo-umbilical point. Restitution rotation was slightly to the right. The right shoulder was born anteriorly.—Dr. B. G. Morison read notes of a series of cases of Pseudo-diphtheritic Throat. Six of these seemed to follow definitely frequent communication from another similarly affected. The incubation was not constant. In two of the cases diphtheria was excluded bacteriologically and the staphylococcus and streptococcus longus were isolated. Dr. Morison thought the appearance of these throats suggested erysipelas and he pointed out the greater pain, inflammation, cervical lymphadenitis, and the yellow-white points or patches in this disease rather than the thicker kid leathery appearance of diphtheria. Attention was also directed to the higher pyrexia and the less nervous and general depression in cases of this type than in true diphtheria. All the patients in this series recovered in a variable time.

MANCHESTER PATHOLOGICAL SOCIETY.—A meeting of this society was held on April 11th at Owens College, Mr. W. Thorburn, the President, being in the chair.—The President, in opening a discussion on the Pathological Relations of the Thyroid Gland, after referring to the general functions of the thyroid gland, considered athyroidea or deficiency of thyroiodin as produced in animals by experimental, and in man by surgical, removal of the gland. Myxœdema and cretinism were considered and the relationship of goitre to athyroidea was discussed. Hyperthyroidea was described under four headings—namely: (1) poisoning by ingestion of thyroid; (2) "chronic iodism"; (3) exophthalmic goitre; and (4) acute thyroid auto-infection as observed after certain operations upon the gland. Thyroiodin as an antitoxin was illustrated by reference to certain conditions observed in pregnancy and to some septic processes. The treatment of lupus and syphilis by thyroid extract was also mentioned in this connexion. Goitre of the hypertrophic type might be regarded as a compensating over-production of antitoxin. The effects of thyroiodin in goitre and congenital goitre were also referred to.—An interesting discussion followed, in which the following members took part: Dr. E. S. Yonge, Dr. T. Harris, Dr. J. J. Cox, Dr. A. T. Wilkinson, Dr. Rodocanachi, Mr. J. J. Berry, Mr. W. P. Montgomery, Dr. W. H. Brazil, Dr. W. E. Fothergill, Dr. T. C. Railton, and Dr. F. W. Eurich.

Reviews and Notices of Books.

A Text-book of Physiology. By M. FOSTER, M.A., M.D.Lond., F.R.S., assisted by W. H. R. RIVERS, M.A., M.D.Lond. Sixth Edition Revised. Part IV. The Senses. London: Macmillan and Co., Limited. 1900. Pp. 322. Price 10*s.* 6*d.*

IN the preceding editions of Sir Michael Foster's excellent treatise the present volume, the fourth, contained the special muscular mechanisms, such as voice, speech, and locomotion, and also included an account of the male and female organs of generation. It is now restricted to the senses and so many of the additions have been made by Dr. W. H. R. Rivers, the University of Cambridge lecturer in physiological and experimental psychology, that his name appears on the title page with that of Sir Michael Foster. If the subjects now omitted are dealt with in another volume and Dr. Sheridan Lea's Physiological Chemistry be regarded as an integral part of the work Sir Michael Foster's Text-book of Physiology in one volume will have expanded in the course of 24 years into six volumes and is still defective in omitting the large topic of embryology.

This part has been very carefully revised and though many pages are reprinted with scarcely any alteration yet most of the recent additions to our physiological knowledge have been introduced. In the section on the accommodation of the eye to objects at varying distances it is pointed out that according to some observers the curvature of the anterior surface of the lens does not increase uniformly during accommodation, and on the next page it is added that there are several points in the whole action of accommodation which still require to be cleared up. We should have been glad to have had the opinions of the authors on Professor Tscherning's theory to the effect that accommodation is effected by compression of the lens changing its form to one remotely resembling an hour-glass.

The afferent path conducting impressions that lead to the pupil reflex is stated to consist of fibres that are at first mingled with the visual fibres, but near the corpora quadrigemina they collect into a fasciculus which leaves the upper median edge of the optic tract and enters the roof of the anterior corpus quadrigeminum. The vexed question of the presence of radially arranged dilator fibres in the retina, which was strongly opposed by Mr. Jessop in his lectures at the Royal College of Surgeons of England, is very fully discussed, but no positive answer is given.

The subject of Astigmatism is fairly well given, but the distinction between simple, compound, and mixed astigmatism might have been brought out more clearly and with the addition of only a few lines. A woodcut has been added to the section on the Structure of the Retina illustrating the views of Ramon y Cajal and others.

Many recent observations have been introduced—such, for example, as the adaptation of the eye for light and darkness and the fusion of images with varying illumination. The fields of the different colours have been carefully worked over and a new and better woodcut has been introduced showing the relation of the various colours of the spectrum. The different explanations of colour-blindness are fully given and it is shown that on the Young-Helmholtz theory in one of the two classes of red-green blindness—namely, that in which the spectrum is shortened at the red end—the red primary sensation is absent, the two colours in which the spectrum is seen being green and blue. In the other class the green sensation is supposed to be absent, the spectrum being seen as red and blue. These two classes have therefore been called "red-blind" and "green-blind" respectively. The former class sees red as a dark colour, whilst by the latter that colour is seen as of its normal brightness. Hence the authors propose that the red-blind may be called "scoterythrous" and the green-blind "photerythrous." On Hering's theory the red-green substance is supposed to be missing, and the dichromic vision of such persons to be made up exclusively of the changes in the yellow, blue, and white-black substances. The opinion of the authors, which is supported by a case in which one eye was, and the other was not, colour-blind, seems to be in favour of the theory of colour and colour-blindness advanced by Hering, though much obscurity still hangs over the whole subject.

In the section on the Auditory Sensations the same care in the revision of the work is everywhere observable, and the structure both of the middle ear and of the labyrinth is very completely given. The treatise, as it now stands, is a very satisfactory epitome of the present state of physiological knowledge, and must be regarded as the text-book to be read and consulted wherever physiology is seriously pursued as a branch of science and not for the mere purpose of enabling a student to answer a few questions at an examination for a diploma.

Lessons in Elementary Physiology. By THOMAS H. HUXLEY, LL.D., F.R.S. Enlarged and Revised. London: Macmillan and Co., Limited. 1900. Pp. 611.

SIR MICHAEL FOSTER and Dr. Sheridan Lea, who have undertaken to edit the present edition of this well-known manual, state in their preface that their task has been one of great difficulty. The work was originally written by a master of exposition for beginners and therefore contained but little of a controversial character, but aimed at giving a clear and connected account of the fundamental truths of physiology. When it first appeared it obtained a ready sale from the accuracy of its statements, the excellence of the style in which it was written, and the high position of its author. But after the lapse of 34 years, in a progressive science like physiology, some well-assured advances have been made, some errors have been corrected, and some doubtful points have been cleared up. The author himself, as long as he lived, kept the work abreast of the knowledge of the day, and now that he has passed away the long experience of the editors into whose hands the recasting of the volume has fallen may serve to assure the student that if he renders himself thoroughly familiar with the contents of this volume he will possess such knowledge that he will not only have nothing to unlearn, but will be well prepared to understand and appreciate the larger treatises of Michael Foster, Waller, and Stewart. The early editions of the work were but little altered from the first edition published in 1866. The present edition is nearly double the size of the second, third, and fourth, whilst the number of woodcuts has increased from 103 to 185. The editors have striven to retain as far as possible the language employed by the late Professor Huxley, but in such additions as they have found it necessary to make—as, for example, in the subject of blood-pressure and vaso-motor nerve influence, the structure and functions of the spinal cord, and other subjects—they have endeavoured to present the student with an account of recent work written in the same easy and perspicuous style that is so characteristic of the original. The subject of Reproduction is omitted. There is an excellent index. It is a work eminently adapted for the higher classes in schools.

LIBRARY TABLE.

Lessons on Prescriptions and the Art of Prescribing. By W. HANDSEL GRIFFITHS, Ph.D., L.R.C.P.E., Professor of Chemistry in the Ledwich School of Medicine, Dublin. New and revised edition. London: Macmillan and Co. 1899.

Pp. 148. Price 3*s.* 6*d.*—In the first days of professional life, after a student has become qualified, he frequently experiences difficulty in writing prescriptions at full length. He has become so accustomed to write "Mist. Gent. Alk.," or "Haust. Ipecac. Co.," that he forgets the exact ingredients of the mixtures. Again, some of the examining boards require that prescriptions should be written in unabbreviated Latin, and the student naturally wishes to obtain in as small a compass as possible information on this point. The above difficulties are well met in the little work before us. It is arranged in a convenient manner for reference. The chapter on Incompatibility should prove especially valuable. Numerous examples and exercises are given which would yield good practice to students about to enter for their examinations.

The Use of the Sphygmograph in Clinical Medicine. By GRAHAM STEELL, M.D. Edin., F.R.C.P. Lond., Physician to the Manchester Royal Infirmary, Lecturer in Clinical Medicine and in Diseases of the Heart, Owens College. Manchester: Skerratt and Hughes. 1899. Pp. 57.—This little book gives a good account of the use of the sphygmograph in clinical medicine. The study of the working of this instrument is a fascinating one, but requires a considerable amount of time and attention. Moreover, there is a good deal of the personal element in the results obtained, which makes the interpretation of the tracings obtained by different observers rather uncertain. Not that we would disparage its use or value. The information that can be obtained from sphygmograms in skilled hands is great; and there is a further advantage that the records are permanent and can be retained for purposes of comparison. Dr. Steell maintains that the sphygmograph is of greatest value as an aid to treatment, of less value in prognosis, and of least value in diagnosis. We quite agree with his statement. The book is freely illustrated with sphygmograms, and we can cordially recommend it to those who intend to make a systematic use of the instrument.

JOURNALS.

Edinburgh Medical Journal.—In the April number Mr. C. W. Mansell Moullin strongly recommends preventive operation in acute inflammation of the appendix. The words "preventive operation" must, he says, be understood in the strict sense and must not be confused with what is called early operation. Gangrene of the whole appendix may make its appearance within 24 hours of the time when the symptoms were first noticed. In such a case an operation to be preventive must be performed before the expiry of this period, but in some other cases it may not be too late after 48 hours. Dr. W. S. Fenwick writes on Perigastric and Periduodenal Abscess, and Dr. F. W. N. Haultain on Amenorrhœa. Altogether there are seven original articles.

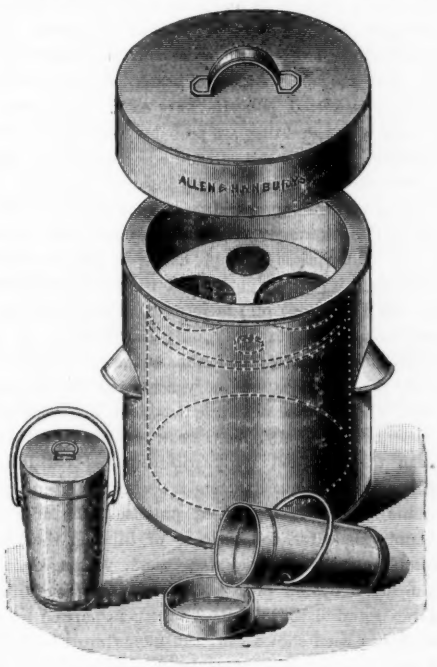
Scottish Medical and Surgical Journal.—The greater part of the April number is occupied by a paper on Heredity in Disease, read before the Edinburgh Medico-Chirurgical Society on March 7th by Professor D. J. Hamilton (Aberdeen); the discussion which followed the reading of the paper is also published. Professor A. R. Simpson (Edinburgh) writes on Levurine, a dried extract of beer yeast which seems to have proved useful in some cases of puerperal septicæmia and in carbuncle. The dose is a teaspoonful given before food until suppuration is arrested and the temperature reduced. There are three other original articles.

Dublin Journal of Medical Science.—The original communications in the April number are as follows: on a fatal case of Congenital Bullous Eruption in an Infant, by Dr. R. H. Kennan; on a case simulating a Perforating Gastric Ulcer, by Dr. W. J. Thompson and Dr. F. C. Dwyer; and on Digitalis in Heart Disease by Dr. R. C. Peacocke. A further instalment of the clinical reports of the Rotunda Hospital is given.

New Inventions.

THE "ALLENBURYS" MILK PASTEURISER.

THIS apparatus, designed by Dr. R. T. Hewlett for the Pasteurisation of a pint of milk at a time, is extremely simple in its action and does not contain any parts which are likely to get out of order. It consists essentially of a double-jacketed cylindrical tin-plate case measuring externally about seven and a half inches both in height and in diameter. Half a pint of milk being placed in each of the two tin cups shown in the illustration, the cups are covered



with their lids and supported in the perforated shelf, and boiling water is then poured in until it begins to flow over the shelf. The lid is now placed on the apparatus and the whole is allowed to stand undisturbed for from 25 to 30 minutes. The milk is then ready for use; it may be cooled, if desired, by filling the container once or twice with cold water. One half-pint only of milk may be Pasteurised if one of the two milk vessels be filled with cold water. The apparatus may be used to keep food warm during the night, and if filled with ice it will also serve as a cooler. The price is 6*s.* 6*d.* The makers are Messrs Allen and Hanburys, Limited, Plough-court, London, E.C.

BATH RURAL DISTRICT.—At the meeting of the Bath Rural District Council held on April 14th Mr. C. Harper, the medical officer of health, presented his annual report. This showed that during 1899 the number of deaths registered for the 19 parishes of the union, comprising an area of 27,266 acres with a population of 28 285, amounted to 345, which was equal to a death-rate of 12 19 per 1000 as compared with 13 40 in 1898. Eliminating deaths at public institutions the death-rate was 11 87 per 1000, the lowest on record. The birth-rate of 24·32 per 1000 was also the lowest recorded.

THE LANCET.

LONDON: SATURDAY, APRIL 28, 1900.

To those who have followed the controversies that have raged around the vaccination question in this country during many years the adoption of measures to secure as pure a vaccine lymph as possible cannot but be welcome. Until quite recently the means at disposal for testing the purity of such lymph were crude and inexact; but now, thanks to bacteriological methods and the knowledge possessed of the nature and character of septic organisms, the determination of the presence or absence of such noxious elements in lymph is rendered comparatively easy. For whatever may be the risks—and they are probably very slight—of the invaccination of disease through the admixture of extraneous matter with vaccine, it is certainly incumbent on those who are concerned with the preparation of such vaccine to reduce the risks to a minimum. The substitution of calf vaccine lymphs for "humanised" lymph has been one step in this direction, since it entirely gets rid of the possibility (remote as this has ever been) of the invaccination of such transmissible human diseases as syphilis and leprosy. A more important change, seeing that it aims at the prevention of the more common complications of vaccination, is that which was first placed on a scientific basis in this country by the investigations of Dr. MONCKTON COPEMAN in 1891—we mean the so-called "glycerinisation of calf-lymph." For although in various quarters the addition of glycerine to vaccine lymph has been long practised, the admixture was mainly made for the purpose of diluting the lymph, the specific efficacy of which was found, within limits, to be unimpaired by the process. Now that, thanks to the researches referred to as well as to others carried on elsewhere, it has been shown that the admixture of glycerine under certain conditions, of which duration in time is an important element, has the effect of virtually destroying the adventitious microbes which may be present in the lymph, a great additional safeguard against inflammatory and septic complications has been obtained. It must not, however, be forgotten that in the great majority of instances, as was clearly shown in the Report of the Royal Commission on Vaccination, these ill-effects are to be ascribed rather to subsequent wound-infection than to inoculation with impure lymph. That this is so does not of course render it less needful to secure supplies as free from extraneous contamination as possible, whilst it only serves to emphasise the importance of scrupulous care in the after-treatment of the recently vaccinated subject.

We publish to-day a detailed report of a Special Commission which we appointed to investigate the question of the purity of various glycerinated calf vaccine lymphs at present in use, and we venture to think that its publication will have a very reassuring effect upon the public as well as the professional mind. In it will be found particulars of some interesting experiments which prove how great is the bactericidal action of glycerine, and how this action is effective in reducing the colonies of growth upon gelatin or agar in proportion to the length of time that the organisms are subjected to it, until a period is reached when most of the non-sporing organisms have disappeared. The glycerine does not get rid of the spore-bearing organisms—which is of small moment, since pathogenic microbes mostly pertain to the non-sporing class. The general result of the inquiry—which, it will be seen, was based on the application of the bacteriological test employed on several occasions and to different samples of the various commercial "lymphs"—is the gratifying one that as regards their purity, i.e., freedom from harmful bacteria, very many of these samples are above the standard of that supplied by the Local Government Board. It shows also the necessity for a systematic testing of these lymphs in order that the standard of purity may be maintained as well as the efficacy of the vaccination obtained by their use. We trust that the remarks made in the report as to "the necessity for preliminary cleanliness and antiseptic precautions accompanying the preparation and collection of lymph" will be carefully noted by those who are responsible for the preparation; and we observe with satisfaction that in most cases the calves are killed and examined with the view to their being declared free from tuberculosis or other infectious disease before the lymph is put on the market.

Nevertheless, satisfactory as the general result of this inquiry may be held to be, it shows that there is still room for improvement, since there is yet much diversity in respect to the degree to which extraneous bacteria are present, and in hardly any case has uniform sterility been established. Considering the chances for accidental contamination such an absolute degree of purity may be unattainable, but certainly it can be often more nearly reached with proper care taken in collection and in the process of glycerinisation. But one thing is clear. The objection to the practice of vaccination on the score that there is risk of concurrent septic inoculation is one which can have absolutely no *locus standi* while lymph properly prepared is capable of passing the strictest bacteriological test. Nor is the efficacy of the vaccine itself at all impaired by the glycerinising process; indeed, it sometimes even seems to be rendered more marked. At the same time, the freer the lymph is from extraneous pyogenic organisms the less marked will be those inflammatory concomitants which are so familiar to all vaccinators. Without entering into the question as to how far the "areola" is an essential part of the vaccine vesicle or not, it does certainly appear as if much that has often been regarded as essential is not so much due to the action of the vaccinal organism itself as to organisms acting as irritants upon the cutaneous tissues. The purer the lymph apparently the longer is the time taken for the formation of the vesicle and the less marked the stage of so-called "maturity" or pustulation. Indeed, there is reason to believe that the immunity conferred by vaccination is just as marked when the local effects practically stop short at the characteristic vesiculation. For as our report says: "One statement that

may be accepted without reserve is that *if the lymph be free from bacteria (especially streptococci and staphylococci) and typical vesicles slow of development with little inflammatory areola and late in coming to maturity be obtained*, there need be no fear that the patient is not properly vaccinated."

THE subject selected by Dr. W. B. CHEADLE for the Lumleian Lectures this year, "Some Cirrhoses of the Liver," is one which will attract unusual attention. Cases of cirrhosis of the liver are of frequent occurrence, but our knowledge in regard to the disease has advanced but little during recent years. The physical condition of the liver can only be examined during life partially by the sense of touch, aided in a minor degree by auscultation and percussion. The state of its complex functions can only be inferred, and that imperfectly, by the effects of their disorder upon other organs. The difficulties which beset the investigation of the condition of the liver and its functions during life have prevented full knowledge being gained on certain points in its pathology, and the clinical history of its diseases has remained in many respects unsettled. Amongst undetermined questions with regard to disorders of the liver are some relating to the cirrhoses, and Dr. CHEADLE had a large field open to him on which to base his discussion. He entered most thoroughly and effectively into many points connected with the group of diseases of the liver comprised under the term "cirrhosis." He referred at length to the three chief forms of cirrhosis, distinguished as the atrophic, hypertrophic, and syphilitic respectively, but it is not our intention to dwell at length on this part of the subject, attractive as it undoubtedly is from a pathological point of view; suffice it to say that the lecturer considered that the lines of demarcation between the different forms have been too rigidly drawn. They hold good with regard to typical examples only, but so many cases are met with of an intermediate type that the usual classification mentioned above is not a satisfactory one, and the result is confusing both clinically and pathologically. Dr. CHEADLE'S arguments have been published in full in our columns.[1] We wish to draw attention more especially to his remarks on the prognosis and treatment of cirrhoses of the liver which are replete with interest and instruction, for these subjects are of great value practically and have been only very briefly dealt with by most observers.

The prognosis naturally varies according to the particular form in which the cirrhosis appears and the conditions associated with it, but as set forth in text-books of medicine it is almost universally and absolutely regarded as unfavourable. Its fatality is looked upon as inevitable and the end speedy. Dr. CHEADLE believes that this unfavourable verdict is more positive than the actual facts warrant and he considers that it has arisen partly from the use of the generic term "cirrhosis" when the condition really intended to be indicated is one form of the disease only—viz., the atrophic contracted liver of LAENNEC. Thus the occurrence of ascites, so significant of evil in that condition, has been assumed to be equally serious in hypertrophic or syphilitic cirrhosis, where its import is less grave. Cirrhosis is, of course, incurable; fibrous tissue is a permanent formation, but it is in itself harmless; it injures only by pressure and it may exist within certain limits for long periods without fatal issue. In some degrees of cirrhosis the glandular structure of the liver is not so extensively injured as to render life impossible, and if the obstruction to the direct portal flow is eased by compensatory channels fair health may be maintained for a season. The prognosis in cirrhosis is almost invariably made with regard to the advent of ascites and turns upon this symptom. Dr. CHEADLE maintains that when the cirrhosis is of the atrophic contracted kind traceable to alcoholic excess the prognosis is the least favourable of all forms of cirrhosis, and if ascites has supervened it probably indicates that the disease has reached its final stage. In this opinion he is supported by most authorities, although he quotes several cases in which in spite of the appearance of ascites life has been prolonged for a considerable period. He points out that much depends upon the condition of general nutrition. In proportion as this is satisfactory the prognosis is more hopeful of respite. If emaciation and cachexia have advanced the condition is one of proximate gravity. In hypertrophic cirrhosis the prognosis is less gloomy. In the majority of cases, it is true, the disease progresses to a fatal ending, but far less certainly and less rapidly than in the contracted form. The lecturer considered that the distinctive features of the favourable cases are: 1. When the liver is large and the cirrhosis probably more acute. A certain proportion of these cases are of syphilitic origin and others are of a mixed syphilitic and alcoholic type, but some are to be attributed purely to alcohol. 2. The subjects are on the average younger than in the less favourable cases of contracted liver. 3. The patients are in a condition of fairly good nutrition and are not emaciated, cachectic, alcoholic wrecks. These characteristics all point to the conclusion that the morbid change is of a more active character than in the less favourable contracted form of cirrhosis when the invading tissue is of a more gradual and slower growth. These points were argued with great skill by Dr. CHEADLE and should prove of value in forming a prognosis in cases of cirrhosis.

In the matter of treatment, also, the lecturer brought forward arguments and illustrative cases which would tend to modify the treatment usually adopted for the relief of hepatic cirrhosis. The treatment resolves itself chiefly into an attempt to preserve the *status quo antea* as far as the liver is concerned; to prevent the disease advancing and to relieve any difficulties or imperfections which may arise in the bodily condition as the result of the hepatic insufficiency. Absolute abstention from alcohol and all stimulating ingesta must of course be absolutely insisted on, unless the patient be in the last stage of emaciation and exhaustion, when the total deprivation of alcohol may hasten the end. With regard to drugs, mercury, iodide of potassium, and digitalis were advised in appropriate cases. But it is in regard to the treatment of ascites that Dr. CHEADLE'S remarks deserve especial attention. All authorities are agreed that the fluid should be removed, but they differ as to when

[1] THE LANCET, March 31st (p. 903) and April 7th (p. 985) and 14th p. 1045).

and how it should be done. Some rely mainly upon diuretics and purgatives and only advise tapping when the symptoms become urgent. Dr. CHEADLE considers that the former class of drugs are "constantly futile," whilst with regard to the latter class he says: "It may be affirmed without hesitation that hard purging is in these cases a pernicious and fatal practice." He considers that purgatives are absolutely ineffectual as a means of reducing the dropsy, whilst they are most effectual in reducing the strength and nutrition of the cirrhotic patient already enfeebled by the difficulty of drawing a minimum of aliment through obstructed vessels. Having thus disposed of the above methods of treatment in no uncertain terms Dr. CHEADLE states that in his opinion the only reliable plan of removing the abdominal fluid is to draw it off by mechanical means; he considers that the postponement of the operation until the vital machinery is seriously embarrassed is a fatal error and he further urges that the patient should be kept under observation and that paracentesis should be repeated until the fluid ceases to collect and health is fairly restored. Several striking cases were described which demonstrated the success of this plan of treatment. Paracentesis is certainly much more freely resorted to now than formerly was the case and the depleting method by means of purgatives is gradually dropping into disuse. Dr. CHEADLE was one of the earliest to advocate prompt and repeated removal of the ascitic fluid by tapping. He urged the employment of this therapeutic measure at the meeting of the British Medical Association at Nottingham eight years ago and subsequent experience has, he states, strengthened him in his opinion. Whether the use of diuretics and purgatives will be universally discountenanced is open to doubt, but Dr. CHEADLE has done good service in advocating so strongly and persistently the routine adoption of paracentesis.

No one who has even glanced at the casualty returns which have been so frequently appearing of late in connexion with the present war in South Africa can fail to have been struck with the very prominent place which enteric fever occupies in them. This fever has proved a veritable scourge of modern wars and of camp life, especially in tropical and subtropical climates. Even in times of peace it may be said to be conterminous with the presence of the British soldier in India and our colonies, and we might even go further and add with that of the European at home and abroad. Confining our attention to recent times it has played an important, and sometimes a disastrous, part in almost every military expedition—whether American, British, or French. In the Afghan wars of 1878–80 cases of enteric fever occurred at almost all the occupied posts, from British territory in India up to Cabul and Kandahar, and the disease appeared at some posts and camps which had in all probability been occupied for the first time during that campaign. Much the same thing happened in the late Indian campaign on the north-west frontier. Surgeon-General TAYLOR, C.B., the Principal Medical Officer, states in the Army Medical Report for 1898 that "the liability of troops on service to enteric fever even when encamped on what appears to be virgin siol, is a fact in regard to which almost all observers are unanimous, and a considerable part of the increase in both the admission and mortality rates for 1898 can be accounted for by field service." In the Egyptian war of 1882 and other campaigns in that country, in several of the French expeditions, and in the late Spanish-American war this fever is chargeable with having given rise to a vast amount of inefficiency and to considerable loss of life. And so it is with the present war in South Africa, and it may be pretty safely predicated that so it will be in wars yet to come.

In some cases the origin and occurrence of enteric fever may have been difficult to account for, but in the case of South Africa it is comparatively easy to find an explanation in the fact that the disease was already there and that the conditions favourable to its spread and development were likewise present. In Ladysmith this was apparently the case; none of the factors were absent under the conditions that obtained during the protracted siege of that place, and we ventured to prophesy at the beginning of the war from its past medical history that we might expect the occurrence of a large amount of enteric fever among other diseases at this and other stations—Pietermaritzburg, for example. The special correspondent of the *Times* in Ladysmith sent home not long ago some interesting statistical information respecting the siege, an abstract of which was given in that paper on April 23rd. We learn from this that when the siege commenced on Nov. 2nd the effective strength of the garrison was 572 officers and 12,924 men. The effective strength at the end of the siege (March 1st) was returned as 403 officers and 9761 men; but these, it is significantly added, were "the only troops fit to do even a two miles' march." There were at that date 154 officers and 2624 men in hospital. These figures tally well with information received from other sources. During the siege 18 officers and 193 men were killed, 70 officers and 539 men were wounded, and 10 men were missing. Of the wounded eight officers and 51 men died, and 12 officers, 529 men, and 22 followers died from disease. The total admissions to hospital during the siege were 10,688. Disease, chiefly enteric fever and dysentery, commenced to assume serious proportions towards the end of December and attained its greatest height at the end of January. The death-rate increased at the end of December and from the second week of January averaged over eight deaths per diem.

The Army Medical Department Report for 1898 has just been published and we naturally turned to that part of the volume bearing upon the health of the troops serving in South Africa during that year. We have gathered some interesting and instructive information from this source. Enteric fever caused 273 admissions and 48 deaths, equal to ratios of 32·9 and 5·77 per 1000, which are higher than the previous year's rates and than the average ratios for the 10 years 1888–97 by 20·1 and 3·90 respectively. The percentage of mortality to attacks was 17·6, as compared with 8·1 in 1897, and 14·6, the average of the previous 10 years. The admissions and deaths were distributed as follows: 118 cases, with 21 deaths, at Ladysmith; 114 cases, with 18 deaths, at Pietermaritzburg; 24 cases, with 6 deaths, at Wynberg; 10 cases, with 2 deaths, at King William's Town; 3 non-fatal cases at Simonstown; 2 cases, with

1 death, at Cape Town; and 2 cases, non-fatal, at Fort Pine. The prevalence of enteric fever in the command is stated in the report to be assuming grave proportions, more especially in Natal. The Principal Medical Officer remarks that the disease seems to be endemic in South Africa and to be associated with the rainfall, the subsequent drying of the ground, and the dissemination of polluted soil dust by winds, causing the access of disease germs to water and food supplies. The marked incidence of enteric fever at Ladysmith was supposed to be associated with the presence of polluted soil, inadequate means of preventing continuance of pollution, and want of cultivation to prevent the soil being blown about as dust by the winds that prevail there. Pollution of the Klip river is also noted as a probable cause of the enteric fever in the locality. Ladysmith, which was occupied as a new military station in May, 1897, "has not been a success so far from a health point of view." In explanation of this the Principal Medical Officer reports that the camp is too closely built on a site previously undrained and occupied by tents, that the huts are too hot in summer and bitterly cold in winter (it is noted that in July 16 degrees of frost were registered), and that they are without proper floor or roof ventilation, while during the rains the ground underneath them becomes damp from soakage. The camp ground is bare of trees and grass and in dry weather is covered thickly with dust which, on account of the complete absence of drainage, is considered to be polluted with filth. The reservoirs and filtering beds are uncovered and the cooking is done in field kitchens, so that both water and food supplies are liable to become permeated with this dust. Recommendations have been made with a view to remedying all these defects, and a suggestion has also been made to collect and store rain-water for use during the months when the river water is muddy.

It is sometimes extremely difficult, nay, impossible, to account for the outbreak of enteric fever among troops on active service, just as it is impossible to explain the number of sporadic cases which occur yearly in rural districts and apparently independently of one another. If the disease depends for its cause upon a specific bacillus it can never arise *de novo*. There have been various explanations proffered from time to time as to the possible part played by tramps and ambulant cases of the disease, the agency of foul soil, and so forth. Quite recently Dr. HORTON-SMITH in the Goulstonian Lectures at the Royal College of Physicians of London has, among other things, pointed out how much longer and more persistently than had hitherto been believed to be possible a patient, after having recovered from an attack of enteric fever, may bear about with him the specific and infecting germs of the disease. But in the case of Ladysmith and other stations in South Africa we have apparently no need to have recourse to such explanations, although they have always to be borne in mind, for the typhoid fever bacillus seems to be widely distributed in that country and reproduced in the bodies of its numerous victims.

WE publish to-day the four-thousandth number of THE LANCET. The first number appeared on Sunday afternoon, Oct. 5th, 1823, and consisted of 36 octavo pages. Our present issue contains 168 quarto pages; and between the two numbers, so alike in their aim and so different in their appearance, lies the medical history of three-quarters of a century. THE LANCET at its birth was a paper representing even in its tiny shape the views, aspirations, and knowledge of the medical profession. It was devised to disseminate medical information and to make war on the family intrigues and foolish nepotism which swayed the elections to lucrative posts in the metropolitan hospitals and medical corporations. The spread of scientific knowledge was the first object of the paper, and an excellent clinical lecture by Sir ASTLEY COOPER, which occupied the place of honour, was followed by records of interesting cases in surgery and medicine. The paper was partly addressed to students and it was the design of its Founder to make the grievances of students a prominent feature in his agitation for medical reforms, for the education of the student happened 75 years ago to be one of the most burning grievances of the profession. We think that we have a right to record with special pride the fact that the first number of the paper, though so small, was a type of the number which we publish to-day. Then it was as now it is, and now it is as then it was, the aim of THE LANCET to represent completely and fearlessly the best interests of the medical profession, to record scientific progress, to summarise and codify information, and to watch jealously over the social and material well-being of its readers. The developments in medical knowledge have become immense and show no signs of ceasing from their vigorous increase, while medical ethics have grown more complicated as the professional life of the medical man takes on fuller and more diversified shapes in its relation with the public; and as a result the number of topics with which THE LANCET is directly concerned has greatly multiplied. And thus the small pamphlet has been changed into the large newspaper—and thus only. The programme of THE LANCET of 1900 is substantially described in the preface to No. 1, Volume I., which appeared 75 years ago, but the range of subjects has enormously increased during the century now closing and the treatment of these subjects has demanded greater space.

And while we have grown step by step with medical knowledge we have, of course, shared in the gigantic development of the world's press during the nineteenth century. Our grandfathers were harassed by an arbitrary censorship, by mechanical difficulties of distribution, by heavy stamp and paper duties, and by an advertisement tax which deprived the management of an obvious source of revenue. Sell's "Dictionary of the Press" for 1900 reminds us that the *Times* when it was started early in the century was a mere pigmy in comparison with the giant of to-day and adds that "notwithstanding its small size and small circulation it was far more troublesome to produce than is its ponderous progeny." In this connexion we shall be excused if we refer briefly to the work of the Founder of THE LANCET. The newspaper proprietors and the public of to-day owe a considerable debt to THOMAS WAKLEY among other persons for his action with regard to the Newspaper Stamp Act. The taxation of newspapers, an impost for the first time levied at the beginning of the eighteenth century, had grown gradually heavier and heavier until in 1833, when WAKLEY'S interest in politics first became serious

and definite, it amounted to a tax upon knowledge. The first tax on newspapers was imposed in 1712, when it was enacted that all papers containing public news or intelligence were to be taxed at the rate of a ½*d.* if printed on half a sheet of paper and 1*d.* if on a whole sheet. The same Act imposed a tax of 1*s.* on any advertisement that appeared in a paper published weekly or more often. In 1776 the newspaper stamp duty was 1½*d.* and in 1789 it had risen to 2*d.* The advertisement duty of 1*s.* was doubled in 1757 and in 1789 PITT increased it by 6*d.*, making the duty 2*s.* 6*d.* on each advertisement. Again, in 1804 the newspaper stamp duty was raised to 3½*d.* and the duty on advertisements to 3*s.* 6*d.* In 1815 the newspaper stamp duty had become 4*d.*, the advertisement duty remaining unabated, while the duty on paper (before printed) varied from 1½*d.* to 3*d.* per pound. In 1833, in consequence of agitation within and without Parliament, in which WAKLEY played a characteristically vigorous part, the advertisement duty was reduced to 1*s.* 6*d.* Three years later a new and highly successful movement against the impost was carried on, and with the story of this again WAKLEY'S name is closely associated with the names of GROTE, MOLESWORTH, BULWER LYTTON, and DANIEL O'CONNELL. The results of their labours, as seen in the reforms of the next 25 years, can be set out in a few words. On Sept. 5th, 1836, the newspaper stamp duty was reduced to 1*d.* on papers containing 1530 square inches, 1½*d.* if above that and under 2295 square inches, and 2*d.* if of the latter size or above. Again in 1853 the stamp duty was reduced to 1*d.* for every sheet under 2295 square inches; but the advertisement duty was entirely abolished by an Act passed on August 4th, 1853. In 1855 the newspaper stamp duty was entirely abolished. In 1861 GLADSTONE completed the work of removing all taxation from knowledge by doing away with the paper duty. In this story of increasing taxation and gradual remission by far the most important episodes were the two in which WAKLEY was actively concerned—viz., the agitation of 1833 which produced the reduction in the tax upon advertisements, and that of 1836 which resulted in an important and substantial remission of the stamp duty The taxation had all been on the ascending scale before, but these two occasions marked the feeling of the country that a highly taxed press was not creditable to a free nation.

We are glad to enjoy the confidence of the medical profession that was extended to the Founder of THE LANCET, as we are proud to record his share in the prosperity of the national press. A little garrulity and a little pride in past exploits are universally allowed to old age, and we trust that the egotism of these remarks will be condoned inasmuch as they have been made upon the date of our four-thousandth number.

FREEMASONRY IN THE TRANSVAAL.—At the last meeting of the Kendal Franks Lodge, I.C., held at Jeppestown Masonic Temple, Dr. J. Taylor-Brown was elected W.M. for the ensuing year, the installation to take place as soon as possible after the termination of the war. Dr. Kendal Franks, I.P.M., was elected director of ceremonies.

Annotations.

"Ne quid nimis."

THE REWARD OF GALLANTRY.

WE have all read with pride of the devotion to duty and conspicuous courage exhibited by Major William Babtie, C.M.G., of the Royal Army Medical Corps, at the battle of Colenso and it is now our pleasant duty to have to congratulate that officer upon the fact that the Queen has been graciously pleased to signify her intention to confer the decoration of the Victoria Cross upon him. The announcement appeared in the *London Gazette* of April 20th, 1900. The following is the act of courage for which he was recommended. At Colenso, on Dec. 15th, 1899, the wounded of the 14th and 66th Batteries Royal Field Artillery were lying in an advanced donga close in the rear of the guns without any medical officer to attend to them, and when a message was sent back asking for assistance Major W. Babtie, R.A.M.C., rode up under a heavy rifle fire, his pony being hit three times. When he arrived at the donga, where the wounded were lying in sheltered corners, he attended to them all, going from place to place exposed to the heavy rifle fire which greeted anyone who showed himself. Later in the day Major Babtie went out with Captain Congreve to bring in Lieutenant Roberts who was lying wounded on the veldt. This also was under a heavy fire.

THE THIRTEENTH INTERNATIONAL CONGRESS OF MEDICINE, PARIS, AUGUST, 1900.

THE near approach of the International Medical Congress which is to be held at Paris from August 2nd to 9th makes it necessary for everyone who intends to be present to provide himself with a ticket of membership as soon as possible. Application forms can be obtained from the secretaries of the National Committee for Great Britain and Ireland, Dr. A. E. Garrod, 9, Chandos-street, or Mr. D'Arcy Power, 10A, Chandos-street, Cavendish-square, London, W. Each form should be returned to the secretaries duly filled up and signed, together with a visiting card attached and a cheque or postal order for 20*s.* The application forms are then sent to Paris and in due course the applicant receives a card of membership which entitles the holder to attend the meetings of any section of the Congress and to obtain from the office of the secretary-general at Paris (21, rue de l'École de Médecine) badges and the various publications two days before the official opening of the Congress. After the conclusion of the Congress each member will receive an abstract of the proceedings in all the sections and the detailed proceedings of the section in which he is especially interested, as shown by his placing it first upon his form of application. The ticket of membership is further accompanied by a non-transferable form securing to the bearer a free return journey from Paris to the frontier by the same route and in the same class of carriage as that in which he entered France. This order is available for the return journey from July 20th to August 20th, 1900. It must be *visé'd* at the departure station, certified in Paris, and exchanged for a ticket on the return journey. The English railway companies are willing to issue tickets at reduced rates to members of the Congress who present their cards of membership at the time of booking. The South-Eastern and Chatham and Dover Railways charge 58*s.* 4*d.* first-class and 37*s.* 6*d.* second-class for return tickets available for 14 days by the 2.45 P.M. service *viâ* Folkestone and Boulogne and by the 9 P.M. service *viâ* Dover and Calais. Each ticket will entitle the holder to a free allowance of 56 lb. of luggage

and will be available to return from Paris by the 3.45 P.M. or 9 P.M. services. The London, Brighton, and South Coast Railway have made arrangements to issue 14-day excursion tickets from London or any station on the Brighton Railway to Paris and back at 39*s.* 3*d.* first-class or 30*s.* 3*d.* second-class to members of the Congress. These tickets can be extended to 25 days if desired and they allow the journey to be broken at Brighton, Lewes, Newhaven, Dieppe, and Rouen, both going and returning.

ÆSCULAPIUS AND HIS SANCTUARY.

A PAPER by Dr. W. S. Colman, read before the Medical and Physical Society of St. Thomas's Hospital and published in vol. xxvii. of the St. Thomas's Hospital Reports, gives some interesting particulars relative to the great temple of Æsculapius at Epidaurus and the strange combination of religious worship, medical treatment, and charlatanism which formed the occupation of the priests. The dormitory or abaton in which the cures took place was a great Ionic colonnade, 250 feet long and 32 feet wide, divided into an eastern and a western section; in the western there were two stories. Benches of limestone extended along the side walls like a divan, and there were similar slabs to serve as couches placed transversely in the intervals between the pillars. In these wards and in the temple inscriptions were placed recording the ailments of some of the patients and the means by which they were relieved. Dr. Colman's map of the locality shows that the surroundings of the temple included baths, a gymnasium, a racecourse, and a temple of Artemis; there was also in the immediate neighbourhood a temple of Aphrodite, a divinity whose cult is not recognised in modern health resorts. Many surprising cures are recorded in the inscriptions, and with reference to this circumstance Dr. Colman says that there is a curious difference between the ancient and the modern methods, for patients on their discharge do not now put up a tablet in the chapel recording their gratitude to St. Thomas, but it is the physician or the surgeon who puts up the votive inscription for the information of other sufferers, not in the chapel, but in the columns of THE LANCET.

THE VARIOUS FORMS OF TETANUS.

JEAN BINOT (Thèse de Paris, 1899) made a large number of experiments at the Pasteur Institute to determine clearly the nature and character of the various forms of tetanus. Tetanus toxins obtained from pure cultures were injected into the peritoneal cavity, stomach, trachea, lungs, liver, kidneys, bladder, uterus, testicles, and lymphatic glands of the body, and the symptoms were carefully noted. As a result of these experiments it appeared that a special form of tetanus followed the injection in every case, and these forms were symptomatically different also from cerebral tetanus as well as from ordinary tetanus with convulsions such as followed wounds. The fatal dose of tetanus toxin was almost the same when injected into the various organs above mentioned as when given hypodermically, but the symptoms of splanchnic tetanus (following injection into the peritoneal cavity) appeared later—i.e., in from 40 to 48 hours instead of from 16 to 22 hours after the injection—and its course was more rapid after the first symptoms appeared. The initial manifestations were peculiar generalised vibratory tremors, extreme dyspnœa with hiccough and convulsive yawnings, and spasmodic contractions (openings) of the jaws. These phenomena presented irregular remissions; permanent contractions were never present, and trismus was never permanent. The condition preceding death was characterised by extreme lowering of bodily temperature (hypothermia) and complete muscular flaccidity of the animal. The administration of the toxin by the mouth was followed by little or no toxic effect, while the bladder could tolerate as much as one cubic centimetre of the toxin without serious result. On the other hand the injection of a few minims of the toxin into the unwounded respiratory tract (trachea) produced a tetanus resembling the splanchnic variety which was attended invariably with fatal results. M. Binot expresses his belief that as the viscera are innervated principally or exclusively by the sympathetic system of nerves it is probable that there are corresponding types of tetanus the starting-points of which are in the sympathetic system and the manifestations of which differ from those primarily due to disturbances of the cerebro-spinal system. Both experiments and clinical observations appear to support this view. Thus after inoculating the tetanus toxin into the lumbar spinal cord a clinical form of tetanus with marked persistent contractures followed, together with tremors, which passed into clonic convulsions, and a special tetanic attitude. When the injection was made into the carotid artery the symptoms were very irregular and inconstant, and the results of injection merely into the cavity of the spinal canal closely resembled those of intra-carotid injection. The free application of the toxin to the raw skin after scraping and scarification was without result and the toxin introduced into the internal auditory canal also produced no effect. On the other hand, the nasal mucous membrane absorbed the poison readily and a typical splanchnic tetanus resulted. Injections into the various striated muscles of the body and limbs gave very constant results. The diaphragm responded very readily to the poison and one-tenth of the ordinarily fatal dose injected into its substance produced a permanent localised contracture followed by extreme dyspnœa, syncope, and death. In cases of splanchnic tetanus death could be prevented by an injection of antitoxic serum administered in time, but if the symptoms of tetanus once appeared it was impossible to save the animal. By the intra-cerebral injection of the antitoxic serum all animals inoculated in the limbs with toxin could be saved even if some hours had elapsed after the appearance of tetanic symptoms.

DEATH FROM LIGHTNING STROKE.

DEATH from lightning-stroke is so rare an occurrence that a careful report of any case where this fatality has occurred is of great interest. Upon Easter Monday, April 16th, a football match was played at St. Mary Cray, Kent. The match was witnessed by spectators from the upper portion of the pavilion and several of the players were at the time of the thunderstorm in the dressing-rooms, which are situated in the lower portion of the building. Some 20 persons were struck but only one was killed. The pavilion is a wooden building with a corrugated iron roof. The upper portion serves as a stand and the lower as dressing-rooms. The height at the back of the stand from floor to ceiling is something over six feet. At the right hand front corner of the building is a wooden flagstaff 25 feet in height which touches the iron roof and is surmounted by an iron pulley. This flagstaff was struck and split as far as the roof. The man who was killed, whose name was Davis, was over six feet in height and would nearly have touched the roof had he been standing upright. A man who was standing next to Davis, named Robinson, felt only a slight shock and was but a little dazed, while another man named Richardson who was standing about a yard in front of Davis when the latter was killed felt absolutely nothing. Nine persons to the right and in front of Mr. Davis received a shock in varying degrees of force. Ten players who were in the dressing-room were also affected, but not very severely, and one of them, John Lee who was standing immediately under the spot where Mr. Davis stood was so slightly struck that he ran out of the building at once. Evidently the main discharge found its

way to earth by the flagstaff, along the roof, through the body of Davis, and so to the dressing-room. The body of Davis was much burned. The accident shows very well how curiously local are the effects of a lightning discharge. Dr. C. G. Battiscombe, who has sent us an account of the case, mentions that Davis was quite dry, but it would be interesting to know whether the player Lee was wet. If so he would, or rather his clothes would, conduct better, which might account in part for his escape. The other persons who were struck all suffered from shock and many exhibited "tree markings" of the skin which, however, soon disappeared. They were treated by Dr. Battiscombe and Mr. T. W. Bailey and some of them were still under care on April 24th.

ŒSOPHAGOSCOPY AND GASTROSCOPY.

THE mind of the people has decided that "seeing is believing," and even in medicine diagnosis is hardly complete until the diseased tissues have been seen. Many endeavours have been made from time to time to investigate the interior of the œsophagus and the stomach by the aid of sight, but there are peculiar difficulties in the way. The use of a straight, rigid tube is practically necessary, but such a tube cannot with safety be introduced. An ingenious expedient has been adopted by Dr. Georg Kelling of Dresden to overcome this difficulty. The tube when passed into the œsophagus is flexible, but it is subsequently straightened and made rigid. In this way, with a minimum of danger to the patient, a fairly satisfactory view can be obtained of the interior of the œsophagus and of the stomach. We publish in this issue of THE LANCET a full account by Dr. Kelling of the construction and use of his ingenious instruments, the œsophagoscope and the gastroscope, to which we refer our readers. The practical employment of the œsophagoscope and the gastroscope will probably always be limited to those who accustom themselves to them by frequent use, and practice on the cadaver.

THE BIRMINGHAM UNIVERSITY.

THE new Birmingham University, as was to be expected, is to be concerned largely with commercial and industrial training. The report of the Advisory Committee appointed to inquire into the best methods of providing such training has recently been issued and deals with a visit of inspection paid to various universities in the United States and Canada. Industrial science as taught at universities in Great Britain was also examined, but the committee came to the conclusion that no teaching upon such points likely to be useful exists in any college of Great Britain. It is proposed to supplement the teaching already provided in Mason College by chairs of mining, metallurgy, engineering, and applied chemistry. The deputations appointed to go to the United States and to Canada report that subdivision of subjects and specialism are carried much farther there than with us. It must be remembered, however, that specialism in commercial and industrial occupations may easily develop into over-specialism, and we might almost say has already done so in some instances. It undoubtedly cheapens labour and output, but we are not sure that these are invariably advantages. For instance, a pair of boots made by one man, hand-made that is to say, is far superior to a pair made in bits partly by machines and partly by clickers, closers, and finishers who are severally confined to one branch of the trade. The craftsman of old days made a thing himself and it bore the stamp of his own individuality; the "hand" of to-day is a mere machine and a very cheap one at that. However, we wish the new university all success and without doubt the Faculties of metallurgy and of applied chemistry will have plenty to do. The problem of the economical and cleanly production of electricity other than by water power still remains to be solved and if solved would add enormously to both the comfort and health of the populace.

ROYAL ARMY MEDICAL CORPS FUND.

IT will be remembered that in our account of the meeting of the Central Committee of this Fund, which was held at 11, Grafton-street, W., on Feb. 5th, we mentioned the suggested formation of local committees in the provinces which should work with the Central Committee. Some weeks ago a local committee for Birmingham and the neighbouring district was formed to assist the Central Committee in London and as a result of the local appeal nearly £265 have been received, the bulk of which has been sent to the London committee for distribution, but the sum of £23 collected in Lichfield has been sent direct to Surgeon-General Wilson in Cape Town. In addition to the money collected, garments of various kinds numbering nearly 4000 in all have been sent to the London committee. The Birmingham committee will still remain in existence in case further demands are made by the prolonged stay of the troops in South Africa.

DISCHARGE OF CEREBRO-SPINAL FLUID FROM THE NOSE.

IN the *New York Medical Journal* of March 31st Dr. W. Freudenthal has published a case of this very rare condition. The patient, a woman, aged 50 years, was seen in June, 1899. In October, 1898, she had "fever which left her with a cough." Since that time her nose had been steadily dripping. A year before the dripping commenced she began to complain of pain in the forehead above the nose. She suffered from it by night and by day and thought that she would go out of her mind and she became mentally dull. When the dripping began her senses—for example, hearing—became acuter. When she came under observation she was using more than 20 pocket-handkerchiefs a day. There was constant dripping of watery fluid from the nose throughout the day and the night. It increased when she leaned her head forwards; when she lay on her back the discharge ran into the throat. In the morning her pillows generally were saturated. On examination by Killian's method with the head bent slightly forward the discharge was observed to collect between the middle turbinate bone and the septum and thence to run down into the vestibule. In December, 1899, there was an intermission in the escape of fluid, which was followed by symptoms of brain pressure. She became dull and apathetic, though she was generally talkative. When the flow began again her condition improved. The fluid was watery, of specific gravity 1007, it contained 1·3 per cent. of solids, 0·39 per cent. of salts, a reducing substance which calculated as glucose was equal to 0·05 per cent., and a trace of phosphorus. Mucin was entirely absent. There were "receding neuro-retinitis in the left eye and a mild degree of papillitis in the right." The sense of smell was completely lost. Polypi were twice removed from the nose. Dr. Freudenthal regards the constancy of the flow of fluid by day and by night as most important in the diagnosis of this condition from nasal hydrorrhœa. In all the cases of the latter which he could find recorded the flow stopped at night, while in all undoubted cases of cerebro-spinal discharge the flow persisted. The pathology of cases of escape of cerebro-spinal fluid is very obscure; only very few necropsies have been made. In one case, according to Dr. StClair Thomson, the fluid escaped through a small hole in the dura mater alongside the crista galli. In other cases no communication could be found. The formation of polypi is supposed to be due to irritation of the nasal mucous membrane by the discharge. Dr. StClair Thomson

warns against any attempt to restrain the flow as well as against intra-nasal medication.

THE STATE CHILDREN'S ASSOCIATION.

ALTHOUGH this society has now entered upon the fourth year of its existence the aims of its work cannot be too well known and we therefore repeat them from the third annual report which has just been issued. They are:—

To obtain the dissolution of large aggregated schools, so that the children may be brought up when possible in families or in small groups, where they will be in daily touch with the various interests and activities of social life; to dissociate the children from all connexion with the workhouse and the officials who have to deal with a pauper class; and to obtain for the State further powers of control over neglected children.

It is unnecessary to dwell upon the importance of this work which must be obvious to everyone, and it is satisfactory to know that the Poor-law Act which was passed last year was almost identical with the Bill which was drafted by the association in 1897. This Act gives to boards of guardians control over the children of paupers of the permanent class whose character or mental deficiency renders them unfit to have the care of their offspring, and also over children of habitual tramps and of the "in" and "out" class, as well as an extended control over orphan children chargeable on the rates. With a view to facilitate the emigration of State-supported children the association has called the attention of the Local Government Board to the matter and is now endeavouring to interest boards of guardians in the subject and urging them to make further use of the powers which they possess. The report deals with other important work of the association and concludes with an appeal for still further activity on the part of its members in inducing others to consider children's needs—"freedom and change, the power to choose and to dare, and the sense of being loved and wanted." Reason, sentiment, and economy are on the side of its members, says the report, and they are certain to find allies in the heads and hearts of those people who, having themselves been happy children, preserve the memory of a free child-life as a bright spot in the past. The report can be obtained (price 3*d.*) from the office of the association, 58, Old Broad-street, E.C., or from Messrs. P. S. King and Son, 2 and 4, Great Smith-street, Westminster.

EPIDEMICS OF MENINGITIS.

BERDACH[1] records an epidemic of meningitis of exceptional extent, occurring in Trifail, a town with a population of 8500 (February to September, 1898), and involving altogether about 72 cases. In addition to these from 26 to 30 abortive cases were met with, producing a total of about 100 patients. 45 cases ended fatally, which is the average mortality. As regards age and sex it was observed that the majority of the patients were young, between the ages of 20 and 25 years, and the next largest group was composed of children below the age of 10 years. The youngest patient was a baby three weeks old, and the oldest a man aged 58 years. The majority of the patients—42 out of the 72 severe cases—were workers in a mine. A map appended to the paper shows the distribution of the disease and the probable path which it pursued from house to house in the town, sometimes a number of houses along the probable route escaping. Infection of several members of a household was occasionally found. The majority of the cases occurred in the spring (March and April), the epidemic being milder in the summer and autumn. In two fatal cases where death resulted on the third and fourth days bacteriological examination showed the presence of the diplococcus meningitidis of Weichselbaum in cultures from the pus on the meninges. Headache was usually observed to affect the occipital region in the milder cases, and the temperature was moderate and only rising in the preagonal stage. The pupils were usually widely dilated and they failed to react to light. Continual vomiting was a feature in one case. Stiffness of the neck was not an early feature. Among the disturbances arising from cerebral irritation and paresis, facial pareses were the most frequent, and among the trophic disturbances herpes was present in nearly every case. The abortive form was characterised clinically by sudden or rapidly developed unconsciousness, and severe headache and nuchal pain, followed by rapid improvement. The treatment followed was, as usual, symptomatic.

[1] Deutsches Archiv für Klinische Medicin, Feb. 6th, 1900.

THE VICISSITUDES OF WEATHER AND OUTBREAKS OF FIRE.

THERE can be little doubt of the relation existing between the condition of the weather and the occurrence of outbreaks of fire. Invariably, for example, when a sharp "snap" of cold weather suddenly sets in big fires are reported in London, and the relationship is not very difficult to trace. It may be that fabrics are more easily combustible in keen dry weather than when the atmosphere is heavily laden with moisture, while accessory to this is the fact that artificial heat is more resorted to when cold weather sets in and so the risks of the firing of inflammable material are increased. Similarly it is recorded that fires happen with a certain onset of hot weather, but in this case the cause is quite different. Thus during the few days which we have recently experienced, when summer weather suddenly (and temporarily) set in, in fact when a heat-wave passed over this country, a series of accidents happened which were due to the explosion of certain chemicals. The chemicals were bisulphide of carbon and ether, which are both volatile and both explosive when mixed with air. There can be little doubt that the short and sudden spell of hot weather accounted for these accidents. Considerable damage was done and some personal injury was reported, but happily no loss of life occurred. These incidents only teach how careful a watch must be kept upon exceptional changes of weather, especially when explosive substances are concerned, but even in everyday life the action of weather is undoubtedly a factor which must be taken into account as likely to be responsible for disasters due to the outbreaks of fire. The exceedingly wide and sudden variations of temperature in this country are indisputably responsible for accidents of the kind just described.

THE PLAGUE IN AUSTRALIA.

LETTERS received from Sydney state that four cases of plague remained under treatment at the end of the week ended March 16th. During the week ended March 17th the figures were 12 cases admitted and three deceased, leaving 13 remaining under treatment. Up to March 17th the total cases were 22, with eight deaths. Of the fatal cases three were discovered only just before or after death, but were reckoned as admissions for convenience. The total "contacts" isolated were 117 in number; there were five cases of plague among the "contacts." These cases occurred in two families. In one family the second case occurred the day after admission. In the other family two attacks occurred on the day of admission, one on the third, and one on the fifth day after admission. With the exception of the cases mentioned in THE LANCET of April 14th all the attacks (17 households) occurred among persons living in the infected area or working in it and quite unacquainted with each other. One case only of the septicæmic form was met with: it occurred in a girl, aged 14 years, and ended within 48 hours. One cervical bubo and two axillar

buboes were observed, all others having been femoral or inguinal. The majority of the patients under treatment seemed likely to recover. Vomiting and more or less epigastric pain were common signs of attack; interference with speech was definitely present in but two or three cases; the same might be said of anxiety, though a pinched expression and pallor about the root of the nose were more often noticed; the bubo was excruciatingly tender in a few cases only. Municipal efforts in the immediate neighbourhood of the infected area are now more energetic and more practical. Steamers engaged in the coastal trade are probably free from rats now owing to the efforts made by companies under direction of the Department of Public Health; a disinfecting and fumigating staff has been organised under which this work will be carried on more thoroughly and more systematically, and to be set in motion only awaits the issue of a proclamation requiring all vessels trading between Sydney and other ports in New South Wales to produce a certificate of such treatment before being allowed to communicate with the shore. Nothing short of practical stoppage of trade can prevent carriage of rats from the shore to the ship in various kinds of cargo; however, a measure of protection will be thus furnished which, supplemented by the strenuous efforts now being made to destroy the wharf rats, may be effectual. Inoculation of all persons living on, or working in, the infected area was systematically pressed, an ample supply of prophylactic for present needs being at hand. Five medical men were housed in a separate establishment for plague duty. In some quarters there was a demand for "plague experts," but for practical clinical purposes this kind of help was not needed, while as to management it seemed likely that a stranger might find himself even more embarrassed by political conditions of general and local government—which can hardly be distinguished from each other—than was the central health authority itself. The authorities in New Caledonia alleged that their infection came from jute-bags imported from India and distributed at Sydney, a point which, however, was doubtful. More recent information as to the plague in Australia is given by Reuter's telegrams in the *Times* of April 23rd which show that up to that date 129 cases of plague with 46 deaths have occurred in Sydney.

PERFORATING ULCER OF THE FOOT IN ALCOHOLIC NEURITIS.

AT the meeting of the Société Médicale des Hôpitaux of Paris on March 16th Professor M. Boinet related two cases of this condition. A man, aged 32 years, had been addicted to alcohol since the age of 14 years; sometimes he took as many as 25 glasses of absinthe in the day. For several years he had walked with difficulty and sensibility had been defective in the feet. The feet and the lower thirds of the legs were almost completely anæsthetic. Acute pains were felt at times in the sciatic nerves. There was no notable muscular atrophy. Walking was performed in an indecisive and incoördinate manner. The knee-jerks were exaggerated. On the posterior part of both heels were two symmetrical perforating ulcers. On the left side the ulcer was red, granular, and deep. It measured two centimetres in diameter and its borders were punched out. Surrounding it was a zone of whitish epidermis. The ulcer was conical in shape and at its apex exposed the plantar fascia. There was complete anæsthesia to temperature and pressure in all parts of the ulcer. On the right side was a similar but slightly smaller ulcer. There was some œdema in the region of the malleoli and numerous drops of sweat covered the feet even in cold weather. After six months, during which the patient did not take alcohol excessively, the ulcers had nearly healed; they were only five millimetres in diameter. The anæsthesia of the feet had disappeared, the sweating had almost ceased, and the œdema was scarcely perceptible. In the second case a man, aged 36 years, had for several years been drinking daily a large quantity of rum, three glasses of absinthe, and two litres (three and a half pints) of wine. Ten months before he came under observation a small blister developed on the sole of the foot over the head of the fifth metatarsal bone. An ulcer followed which had attained a depth of one centimetre. It was surrounded by a ridge of thickened epidermis. This area and the posterior part of the great toe were anæsthetic. In both cases no other cause of the ulceration than alcoholic neuritis could be found.

THE CHAIR OF MEDICINE IN THE UNIVERSITY OF EDINBURGH.

THAT Dr. Osler should decline the candidature for the chair of the Practice of Physic in the Edinburgh University cannot be a matter of surprise. He may well think twice before leaving the land where he is so much at home, in which he has achieved wide fame, which gives a great scope for his genius and his art and which, after all, is only another centre of the great Anglo-Saxon world. Dr. Osler's decision only enhances the interest of the selection to be made by the Curators. Edinburgh is prolific in the production of medical professors and her only difficulty is the *embarras de richesses*. She has one candidate at least whose work in several branches of medicine is recognised throughout Europe and America as lucid and able, as it has been long and laborious, and whose fame as a clinical and practical teacher is indelibly associated with the Edinburgh School of Medicine. We are not disposed to indicate further our forecast of the choice of the authorities of the University of Edinburgh, who are not likely to allow any outside suggestion to interfere with their own sense of what is for the good of their great university.

RECOVERY FROM GLANDERS AND IMMUNITY.

PROFESSOR NOCARD has recently been interesting himself in the above question, particularly with a view to arrive at a definite conclusion as to whether an animal that has recovered from an attack of glanders receives any degree of immunity. The observations made to decide the point are very valuable and interesting. In 1895 an alarming outbreak of glanders occurred amongst the horses of a large omnibus stud in Paris and injections of mallein revealed that no less than 2037 animals were glandered, although there were no clinical symptoms manifest. These horses were carefully isolated and were kept under rigid supervision until visible symptoms appeared, when they were destroyed and carefully examined post mortem. In some of them periodical tests with mallein eventually gave no reaction and the post-mortem examinations of these revealed the lesions to be fibrous or calcified. Cultures made from these lesions remained sterile and animals inoculated from them did not take glanders. Three horses which had ceased to react, together with a perfectly healthy animal (for control purposes), were given water containing virulent glanders material to drink. Some days later the temperature of all four animals went up and for several days it rose and fell alternately, eventually becoming normal again. The mallein test was applied and in each case a marked response occurred. Only one horse showed any visible token of glanders, the submaxillary gland becoming swollen in the usual characteristic manner. All the subjects of the experiment were killed and in each case glanders lesions were found, there being the noticeable difference that whilst in the control animal all the nodules were clearly in the

early stages, those found in the other horses consisted both of fresh lesions and of those which were old, fibrous, or calcified. From this Professor Nocard naturally inferred that recovery had taken place from the original attack, but that the fact of the animals having once had glanders by no means gave them protection against re-infection, the fresh reaction to mallein and the condition of the nodules proving clearly that they had become infected again by the virulent material administered in the drinking-water. Experimental evidence has before been brought forward to show that in the dog one infection with glanders does not confer any degree of immunity, and now the same point has been definitely cleared up with regard to the horse. Professor Nocard's researches on this disease are as much appreciated by veterinarians in England as in France, and it is to be hoped that the time is not far distant when this scourge of the equine race will be absolutely eradicated or at all events be as rare in horses as it fortunately is in man.

THE APPOINTMENT OF MEDICAL OFFICERS OF HEALTH.

SEVEN years ago the corporation of Crewe decided that owing to the rapid increase of the town it was desirable to entrust the sanitary administration to a medical officer of health holding the diploma in public health who should devote the whole of his time and energies to the duties. The wisdom of this step has shown itself in many ways, for during the period named a steam disinfector has been provided, a well-equipped isolation hospital has been erected, many hundreds of insanitary cesspits have been abolished, and water-carriage has been introduced, while the general comfort of the inhabitants has been increased not only in their dwelling-houses but in the huge railway works which extend from one end of the town to the other. The medical officers of health to whose energy and administrative capacity these good results were due have been two in number—viz., Mr. Herbert Jones, who held office from 1893 to 1897, when he became medical officer of health to the Rhondda Urban District Council, and his successor, Dr. Meredith Young, who in the present year has accepted a similar appointment at Stockport. It is difficult to believe that so much good work could have been accomplished if the medical officer of health had been engaged in private practice, however able he might have been and however independent of conflicting interests. We are at a loss, then, to understand the mental attitude of a portion of the municipal council of Crewe, for in spite of the fact that experience is altogether in favour of medical officers of health confining themselves to their public duties and taking no part in ordinary practice, 11 councillors recently voted in favour of reverting to the former system of appointing a medical officer of health at a very small salary and permitting him to engage in private practice. This retrograde step would have the effect of practically entrusting the sanitary administration of the town, with its population approaching 50,000, to one inspector of nuisances. Fortunately, however, the advocates of this course were a minority of the council, and the motion was defeated.

OUR contemporary the *Sanitary Record* has inaugurated a personally-conducted seven days' trip to Paris. The terms are low and the programme (under the special sanction of the Paris municipal authorities) has been especially arranged to appeal to those interested in public health problems. For full particulars application should be made to Secretary, "Paris Excursion," *Sanitary Record*, 5, Fetter-lane, London, E.C.

THE annual meeting and May dinner of the Aberdeen University Club, London, will be held at the Trocadéro Restaurant on May 17th, at 7 P.M. Sir James Westland, K.C.S.I., LL.D., will take the chair, and intending diners should communicate with the honorary secretaries, Mr. J. Gerard Laing and Dr. James Galloway, at 54, Harley-street, W.

THE Colonial Office has received a telegram from the Governor of Mauritius, Sir Charles Bruce, stating that during the week ending April 19th there had been one fresh case of bubonic plague and no deaths.

AN International Anti-Tuberculosis Congress was opened in the San Carlo Theatre, Naples, on Wednesday, April 25th, in the presence of the King and Queen of Italy.

THE *Graphic* this week contains some interesting views of the Imperial Yeomanry Hospital at Deelfontein.

A GENERAL SURVEY OF THE PARIS UNIVERSAL EXHIBITION.

(FROM OUR SPECIAL CORRESPONDENT.)

EVERY day now there is an inauguration at the Exhibition. It may be said that on April 15th the main thoroughfares and the outside of the buildings were officially inaugurated; but since this grand and general ceremony there have been small functions held whenever some one section or separate building is able to open its doors to the public. At the beginning of the week there was a very solemn inauguration by the President of the Republic of the Siberian Section. A few days afterwards M. Millerand, Minister of Commerce, inaugurated the magnificent hothouses of the Horticultural Section and the Governor-General of Algeria opened the doors of the beautiful Algerian Pavilion. Many of the colonial palaces and buildings are now open to the public and the Moorish bazaar is already in full activity. Indeed, the slopes of the Trocadéro will be the best object lesson in geography ever given. The specimens of buildings, trade, life, and amusements of many far-off countries give a better idea of the colonies than could be obtained from the mere reading of books, and all this part of the Exhibition is very nearly complete. In the great galleries of the Champs de Mars confusion still prevails. The exhibitors are busy unpacking and displaying their exhibits inside the glass cases. In the medical and surgical classes a few cases are stocked and ready, but the greater part are still empty. Beyond and near to the ancient machine gallery greater confusion prevails. The sound of many hammers striking metal vibrates through the vast space, workmen are hurrying in all directions, some, carrying heavy loads, pushing their way with difficulty through gazing and dazed spectators. It is an interesting sight, but suggests a huge manufactory in full work rather than an exhibition. On the present occasion heavy machinery will be found in the smaller transverse galleries that precede the great gallery for machinery which was built for the Exhibition of 1889. Within this huge gallery and in its centre has been built the great festival hall where the ceremony of inauguration was held. The roof of the latter finds ample space under the roof of the former and has been so constructed as to render the voice of one person speaking audible to 10,000 persons listening. This hall is a perfect circle enclosed within a square. The angles of the square provide space for the approaches of the circle. The roof is like that of an enormous tent made of glass and sheds a gentle golden light on the scenes below. Paintings cover the bare wall spaces, and it is important to note that these, together with all the surrounding statuary, have but one purport—the honouring of productive work. It is the artisan and the labourer with his implements of work that are to be seen on all sides, and the middle-class man only figures in these ornamental pictures when he is likewise engaged on some productive work, such as the sculptor or the

painter. Indeed, this hall is well suited for the apotheosis of labour. The results of the labour of all nations as exhibited in Paris were inaugurated here; and here, also, at the end of the Exhibition the individul workers will appear in person to receive from the hands of the President of the Republic the honours, decorations, diplomas, medals, &c., that they may have won. About a third of the entire space of what still bears the name of the gallery of machines is taken up by the hall of festivals. The third of the space to the west of this hall is occupied by foreign exhibits devoted to agricultural and alimentary products. Each nationality has walled off its space by some original form of building, so that these enclosures, when viewed from above, give the impression of a town built under the shelter of the lofty, vaulted roof of the great gallery. The other, or Eastern side, contains the same categories of exhibits, but they are all French. Never will there have been a better opportunity of studying the food supplies of the world; and from the public health point of view this is a subject of primary importance.

From these great lateral galleries of the Champs de Mars main building there are two lengthy wings which, like arms, stretch northwards. These likewise existed at the previous Exhibition, but the demand for space has been so pressing that they have been considerably elongated. The western wing is devoted to chemical industries, civil engineering and means of transport, education general and technical, medicine and surgery, art, sciences, and letters. The eastern wing comprises threads, tissues, mines, and metallurgy. Between the two wings are gardens, the great fountain and waterworks known as the Château d'Eau with the Hall of Festivals behind, while at the other end stands resplendent in a new coat of paint our old and lofty friend the Eiffel Tower. At its feet nestle many pavilions and buildings—the Women's Palace, a panoramic journey round the world, any number of other attractions, one of the most notable being the Palace of Costumes, where the dresses worn during the last 2000 years are exhibited in life-like scenes. Then on the banks of the Seine, on each side of the Pont d'Iéna, which connects the Champs de Mars with the Trocadéro, there is a large palace for all that relates to forestry, fishing, and hunting, and on the western side of the bridge is the Palace of Commercial Navigation. Such is the main disposition of the old Exhibition grounds. But there is also the vast square in front of the Invalides and, as additions to the space occupied by previous exhibitions, both sides of the river right up to the Place de la Concorde and a large piece of the Champs Elysées gardens. From practical experience I have found that to get a general idea of the Exhibition, and without stopping to examine any details, it is necessary to walk incessantly for a good three hours. For this purpose I would recommend that the entry be effected from the summit of the Trocadéro, as at this altitude a grand view can be obtained of the greater part of the Exhibition grounds. Then to get a general idea of the colonies it will be necessary to go down and up each side of the Trocadéro hill several times. After that the Seine may be crossed, the main building entered to the right, and pursued down to the machine gallery. The visitor may then turn to the left for the Hall of Festival and come back to the Eiffel Tower by the eastern wing. If he is not by this time utterly exhausted he will here find the platform on rollers to take him to the Invalides or along the southern banks of the river and past the Avenue of Nations. This Avenue of Nations is certainly one of the most admirable features of the Exhibition. Each country has built a house or a palace in its own national style and thus has been constituted the most interesting and picturesque of avenues. The embankments of the Seine may be divided into four sections. On the southern side is the Avenue of Nations from the Invalides to the Pont de l'Alma. Secondly, from this bridge to the Champs de Mars we find another section. Here is the as yet unfinished palace devoted to hygiene and opposite the smaller buildings for all that relates to heating and ventilation. The other and numerous structures contain naval and military exhibits of all countries. At this point a small foot passenger bridge enables the visitor to cross over to the northern or right bank of the river and penetrate what I should term the third division of the embankments. This consists of the Old Paris, recalling Old London at the "Healtheries." It has, however, the advantage of being situated on the river side and can therefore be seen from a distance from the neighbouring bridges and opposite embankment. Thus many picturesque effects are obtained which were lost in the closer confinement of "Old London" at South Kensington. The fourth division is on the other side of the Alma bridge and faces and commands a fine view of the Avenue of Nations situated on the opposite bank. The nearest, a very large building close to the bridge, is the Palace of the Congresses and the Political Economy section. Here are a spacious hall for the congresses and smaller rooms for lectures on the first floor, while below the charts and diagrams and other designs show what has been done by different countries to encourage thrift and to raise the condition of the working-classes. There is much to study here that will interest the social and the sanitary reformer. The next important structures are two enormous hot-houses for the botanical exhibits and an aquarium. Finally, there is the very large pavilion or palace of the Town of Paris. These exhibits overlook the river and may be considered as very serious and scientific. In strange contrast and on the inner side of the main road or at the back of these are placed the most trivial of all the many shows comprised in this vast Exhibition. First we find an eccentricity in the form of an old castle which is built upside down, the roof on the ground, the entrance door right up in the air at the top. To judge from appearances visitors should walk on their heads so as to be able to enter. Then there are the dancing palace, elaborate Punch and Judy shows, comic moving figures, various theatres and entertainments—in fact, a sort of fair. At one end of these four divisions of the two embankments are to the west the two great divisions constituted by the Champs de Mars and the Trocadéro, while at the eastern end is the square of the Invalides with its snow-white palaces, where furniture, the ceramic arts, and all that relates to public and private buildings are exhibited; and on the other side of the river, reached by the monumental Alexander III. bridge, there are the gardens of the Champs Elysées, with the smaller palace of retrospective arts and the larger palace of modern art, more especially painting. These palaces are not yet open, but I am assured that the pictures will all be in their places by April 29th. The Exhibition can thus be topographically divided into eight districts. The four divisions or districts, two on each side of the embankment, might possibly be visited in one and a half days. A whole day can be devoted to the Trocadéro and its colonial sections. The Champs de Mars will require at least two days, the Invalides one day more, and the Champs Elysées art palaces another day. It would be thus difficult to do justice to the Exhibition in less than six days, but to enter fully into all the details and to visit all the side shows six weeks might very well be employed.

Starting from the town side the medical practitioner or the sanitary reformer, if seeking only for that which is of technically direct professional interest, should keep on the right bank of the river till he reaches the Pavilion of the Town of Paris immediately after the Pont des Invalides. Then close to the next bridge, that of the Alma, he will find the Palace of the Congresses. After this he should cross over to the left or southern side and just after the bridge he will come upon the hygiene section. Following the embankment up to the Champs de Mars he will pass under the Eiffel Tower and enter the further wing of the main building. Here and at but little distance from the entrance that is nearest to the Eiffel Tower he will find the medical and surgical exhibits. But though these are the classes that interest him most, many other things scattered in all directions will be found to have a technical bearing upon the sciences that relate to the preservation of health. Though these are not yet all ready at this moment the Pavilion of the Town of Paris is almost finished, and this is probably the most thorough and complete section of the Exhibition. Here every local administrative and public health question is fully illustrated. Medical officers of health, county councillors, poor-law guardians, vestrymen, and all concerned in local administration will find that this pavilion is a veritable storehouse of technical information, readily accessible and easy to understand. Besides, there are intelligent caretakers who are most courteous and ready to explain all that is exhibited.

On a future occasion I hope to deal with technical details. For the present enough has been said with regard to the enormous scope and size of the Exhibition, so that the conscientious visitor will be prepared in good time for the great fatigue which he must endure and from which he will not be able to escape. The attractions are so numerous that he will not be able to resist them.

Paris, April 22nd.

REPORT OF

THE LANCET

Special Commission

ON

GLYCERINATED CALF VACCINE LYMPHS:

NUMBER AND NATURE OF THE "EXTRANEOUS" BACTERIA FOUND IN THE COMMERCIAL VACCINE LYMPHS.

INTRODUCTION.

SOON after the issue of the report of the Royal Commission on Vaccination our attention was drawn to the great advantages that would accrue to the campaign against small-pox if the use of glycerinated vaccine lymph could, safely, be widely extended. In order to obtain an impartial opinion a Commission was appointed to investigate the different glycerinated vaccine lymphs on the market and to determine, if possible, how far the ideal conditions laid down by Dr. Copeman and afterwards published by him in his Milroy Lectures,[1] delivered in 1898, were being realised by those purveying lymph for the use of medical practitioners.

In the present report what may be spoken of as commercial vaccine lymphs—that is, vaccine lymphs that can be obtained from vendors who advertise in the medical press—are considered. For the sake of comparison, however, a sample of the Local Government Board lymph has been examined.

In an investigation of this nature a number of side issues arise, with which at a later stage it may be necessary to deal; but for the present the main factor to be considered is the purity of vaccine from the bacteriological point of view. Many of the experiments here recorded were carried out more than a year and a half ago, but in order to see what progress has been made in the interval a complete series of examinations has recently been made and the results obtained are given in the accompanying tables. It has been found necessary to repeat some of the experiments of others who have given attention to the subject in order that a basis for comparison may be obtained and results previously published confirmed.

THE USE OF GLYCERINE AS A PRESERVATIVE AGENT.

As early as 1850 Mr. R. R. Cheyne, according to the correspondence that appeared in our columns,[2] "mixed glycerine with vaccine lymph ..... with the satisfactory result, better than any theory, of discovering that, in addition to its known property of preventing fermentation and mouldiness in vegetable substances, it had also that of keeping vaccine lymph, an animal product, undecomposed in a fluid state for months."[3] To Copeman and to Chambon and St. Yves-Ménard, working independently, apparently belongs the credit of determining that the addition of glycerine to vaccine lymph not only puts a stop to any multiplication of "extraneous" bacteria but actually in time kills non-spore-bearing organisms, the vaccinal organism (probably a spore-bearing organism), along with certain spore-bearing organisms, being but slightly and slowly affected. Independent testimony to this preservative and purifying action of glycerine has been offered by Leoni, Klein, Koch's German Commission, and other later observers, but little has been added to the results obtained by Copeman, working alone and with Blaxall, and by Chambon and St. Yves-Ménard working with Straus. Müller, Warlomont, and Stephen Mackenzie appear to have used glycerine as a satisfactory diluent for the purpose of making the vaccine "go further," but no purifying effect appears to have been aimed at.

At the present day the addition of a mixture of equal parts of glycerine and saline solution forms part of the routine practice in the preparation of vaccinal matter, this being done with the object (1) of preventing the further development of those extraneous organisms which, by their multiplication and products, not only interfere with the constitution, conservation, and proper activity of the lymph, but also set up irritative and inflammatory processes in the patient on whom the lymph is used; (2) of gradually killing off non-sporing bacteria that may have found their way into the vaccine lymph during some stage or other of its preparation or conservation; (3) of increasing the bulk of the vaccinal matter without, apparently, diminishing but rather increasing its typical *vaccinal* activity, although the severity of the local activity may be even markedly diminished; and (4) of preventing coagulation.

PRELIMINARY EXPERIMENTS.

Bearing the above points in mind, it was necessary, in the first instance, to determine what effect this admixture of glycerine would have on such organisms as would be likely to find their way into vaccine lymph during the processes of collection and preparation. The following experiment was therefore carried out. On April 22nd a paste of all the staphylococci and "torula-form" organisms found in the cultures from two throats was made and to this was added about 40 parts of a mixture of pure glycerine and 10 per cent. sterile saline solution in equal proportions. The mixture made was then plated out in agar and gelatin and at the end of four days the gelatin plate was found to have developed about 84,000,000 colonies per cubic centimetre; the colonies on the agar plates were quite uncountable. At the end of a week this mixture was again tested when it was found that the colonies after four days' growth were much fewer in number, the agar colonies now numbering only about 4,500,000 per cubic centimetre, and the gelatin colonies only 180,000. On May 10th the number had fallen to less than 500,000 on the agar plate and to about 8000 on the gelatin plate. On May 20th the number had fallen on the agar plate to 12,000 and on the gelatin plate to 4000; on June 3rd on the agar plate to 2000 and on the gelatin plate to 2000; and these numbers were approximately maintained on June 10th, 17th, and 24th, and July 1st and 8th, when the experiment was stopped. Put in tabular form we have the following:—

TABLE I.—*Preliminary Experiments (1st Series).*

Date of examination.	Number of organisms per cubic centimetre on agar plate.	Number of organisms per cubic centimetre on gelatin plate.
April 22nd, Control	Uncountable.	84,000,000
„ 29th, 1st week	4,500,000	180,000
May 10th	500,000	8,000
„ 20th	12,000	4,000
June 3rd onwards to July 8th	2,000	2,000

Most of the organisms that had persisted were of a torula form, but there still remained a few "staphylococci," (?) though these were very few in number. These numbers at the later dates are very much over-estimated rather than under-estimated, as in one or two cases the plates that were made, both agar and gelatin, contained no organisms at all; these, however, were not counted in the average. In no case were fewer than three dilutions made and six plates poured, whilst in some instances, especially in the earlier stages of the investigation, six dilutions and 12 plates were made. As the numbers of colonies diminished a smaller number of plates, of course, gave sufficiently accurate results. Altogether the experiments were prolonged over 12 weeks, a count being made about every seven days.

A second and similar experiment was carried out with a mixture of seven non-spore-bearing organisms, consisting of the diphtheria bacillus, bacillus coli communis, bacillus pyocyaneus, a staphylococcus, a streptococcus, a sarcina-form organism, another non-spore-bearing organism not identified, and two spore-bearing organisms—bacillus subtilis and the bacillus mesentericus vulgatus. *One* volume of an emulsion of this mixture was added to, and well mixed with, *two* volumes of glycerine; plates of six dilutions were at once made in agar and a similar series in gelatin. The same material was afterwards examined on 13 occasions at intervals of a week, except between August 19th and Sept. 2nd, during which period no plates were made. The control agar plate gave a growth of 51,750,000 colonies per cubic centimetre and the control gelatin plate 96,000,000 colonies. At the end of a week these colonies had fallen

[1] THE LANCET, May 7th, 14th, and 21st, 1898, pp. 1237, 1303, and 1375.
[2] THE LANCET, March 26th and April 2nd, 1898, pp. 894 and 959.
[3] Copeman, Milroy Lectures, loc. cit.

to 2,600,000 in the agar cultures and 213,000 in the gelatin. After the second week there was only a very slight fall in the number of colonies in the agar cultures; the number in the gelatin cultures remained practically the same. At the end of the third week the number in the agar cultures had fallen to slightly under 1,000,000 and on the gelatin plates to about 111,000. At the end of the fourth week the numbers were 750,000 on agar and 100,000 on gelatin. There was then the interval above referred to, and in the subsequent examinations (nine in number) the whole of the estimations were practically the same—i.e., 250,000 on the agar and 100,000 on the gelatin plates. On coming to analyse these results we find that at the end of the fourth week the whole of the non-spore-bearing organisms had disappeared with the exception of an organism which had most of the characters of the bacillus coli, and as the bacillus coli had been introduced we concluded that this was a weakened bacillus coli whilst during the whole of the period at which the number of organisms appeared to remain stationary nothing but spore-bearing organisms could be found, though it is quite possible that some organisms of the bacillus coli group may have been overlooked. It is evident from this experiment that a few of the bacillus coli organisms along with the spore-bearing organisms may persist to the end of the fourth week, but that the spore-bearing organisms may undoubtedly be found at the end of four and a half months.

TABLE II.—*Preliminary Experiments (2nd Series).*

Date of examination.	Number of organisms per cubic centimetre on agar plate.	Number of organisms per cubic centimetre on gelatin plate.
July 18th, Control	51,750,000	96,000,000
,, 27th, 1st week	2,600,000	213,000
August 2nd, 2nd week	,,	,,
,, 12th, 3rd ,, ...	1,000,000	111,000
,, 19th, 4th ,, ...	750,000	100,000
Onwards to Nov. 11th	250,000	100,000

From these preliminary experiments it was evident that Dr. Copeman was perfectly justified in drawing a sharp line of distinction between the results obtained with sporulating and with non-spore-bearing organisms when mixed with glycerine, as whenever a glycerinated mixture of organisms was brought down to a "constant" as regards the number it contained nothing but spore-bearing organisms could be found. We took, then, as the standard of the amount of work that the glycerine would do its power of getting rid of everything but spore-bearing organisms, amongst which must be included a white streptothrix which appears to be fairly common wherever a number of calves are kept, and a yellow torula-like organism; these, however, like most of the ordinary sporulating bacteria, appear to exert no pathogenic effects.

EXAMINATION OF VACCINE LYMPHS.

The next step was to make an examination of the various vaccine lymphs that could be obtained. A list of those concerning which we could obtain any information was prepared and samples were obtained in the ordinary course of business. The manufacturers who sent them out could have no idea that they were not to be used for ordinary vaccination, all the samples being obtained through an intermediary agent. At the same time a point was made that as much information as possible should be collected, also through the ordinary channels, but that no direct application should be made for such information as could not be obtained by a general practitioner. Such information as we were able to acquire has been embodied in the following report. The examinations were made as soon as possible after the samples had been obtained and a regular routine was followed in order that the results might be fairly comparable. The tubes, of course, were not all of the same size and therefore the numbers in the following tables are not strictly comparable, but in Table XVI. the exact weight of the contents of one of each batch of tubes used is recorded and the number of micro-organisms in each 0·05 gramme of the lymph is given. With these data at our disposal a strictly accurate comparison may be made. In each case an attempt was made, not to isolate and recognise the individual organisms, for that was unnecessary, but to determine the general characters of the organisms as indicating: (1) their probable source; (2) whether they belonged to the spore-bearing or non-spore-bearing groups; and (3) whether they were aerobic or anaerobic.

PRECAUTIONS TAKEN IN TRANSFERRING VACCINE TO NUTRIENT MATERIAL AND IN PREPARATION OF PLATES.

In making cultivations the agar was heated to the temperature of boiling water and then allowed to cool to 40°C.; the gelatin was melted and allowed to cool to 25°C. When the media were ready and the plates had been prepared for the reception of this material the tubes were carefully washed first in bichloride of mercury, then in sterilised water and were afterwards dried in absolute alcohol. With a pair of sterilised forceps one end of the tube was snipped off, the tube being held in the fingers away from the end that was opened; the tube was then taken in a second pair of sterilised forceps and the closed end was gently heated in a small gas flame; as the enclosed air expanded a vapour was generated the lymph was driven out and was allowed to fall into the gelatin or agar tube the (lip of which had previously been carefully sterilised in the Bunsen flame) that was to receive it. After the lymph had been thoroughly mixed with the gelatin or agar it was poured into a sterilised Petri's dish; the plug was returned to the gelatin tube, the plate labeled, and then tube and plate were laid aside and examined daily for four days, the gelatin plates being kept at a temperature of from 20° to 21°C. and the agar plates and glucose-agar tubes—the latter of which, of course, were not poured into plates—at the temperature of the body.

The results obtained with the agar plates are looked upon as the more important because most of the irritant and parasitic micro-organisms grow more readily at the temperature of the body than they do at the temperature of the room. In many cases in which there were comparatively few organisms on the gelatin plates there were still considerable numbers growing on the agar plates and in the glucose-agar. The glucose-agar results are of importance, because they bring into prominence the anaerobic organisms which do not make their appearance either on agar or gelatin plates. The examination therefore was not considered complete except when all three methods had been used. Twelve samples of lymph obtained on the open market and one sent from the laboratories of the Local Government Board were obtained. Seven were examined on three separate occasions, five twice, whilst of the Local Government Board lymph one sample only was examined. The following are the results obtained with the various samples.

(1)

JENNER INSTITUTE FOR CALF LYMPH,

73, CHURCH-ROAD, BATTERSEA, LONDON, S.W.

(WHOLESALE AGENTS: BATTLEY AND WATTS, ELEPHANT-YARD, CRIPPLEGATE, LONDON, E.C.)

Received five 1*s.* tubes of aseptic glycerinated calf lymph, No. 2108, on July 5th, 1898. This lymph is said to be "prepared strictly in accordance with the methods advocated by Dr. S. Monckton Copeman" and to be "free from erysipelas and tubercle."

"The lymph is prepared and glycerinated after the method used in the Government Laboratories in Germany and every step in the process is performed under competent professional superintendence.

Specially selected calves only are used and each calf is tested with tuberculin before being inoculated. After the lymph has been taken from the calf the animal is slaughtered and examined, when, if it is found unhealthy, the lymph is rejected.

Calf lymph prepared with pure glycerine under strict aseptic precautions and stored for some time undergoes a gradual process of bacteriological purification, all pus-producing micro-organisms being eventually destroyed.

The lymph of the Jenner Institute is examined from time to time by means of plate cultivations and is only issued when shown by this method to be free from pyogenic microbes.

Vaccinations performed with lymph thus freed from extraneous micro-organisms may take longer to mature than vaccination with humanised lymph or calf lymph containing such microbes. Even as late as the fifth day the skin over the vaccinated area may appear normal, but on the eighth a pearl-like Jennerian vesicle may be observed standing up on the healthy skin without any surrounding inflammation.

It is advised that when the tube has been once opened the whole of the lymph should be employed immediately and the tube never re-sealed.

The tubes should be kept in a cool place and not exposed to the light until required for use.'

With a tube of this vaccine lymph an agar plate culture

FIG. 1

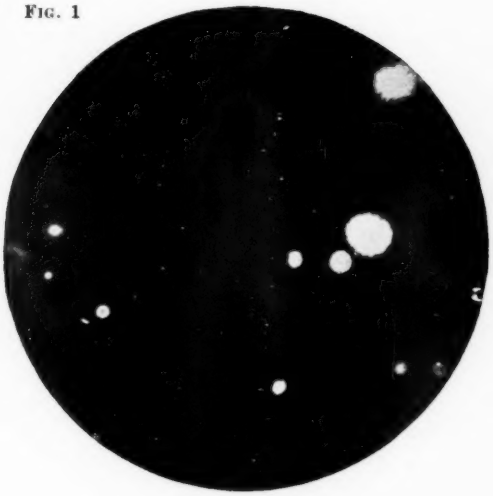


FIG. 4

FIG. 2

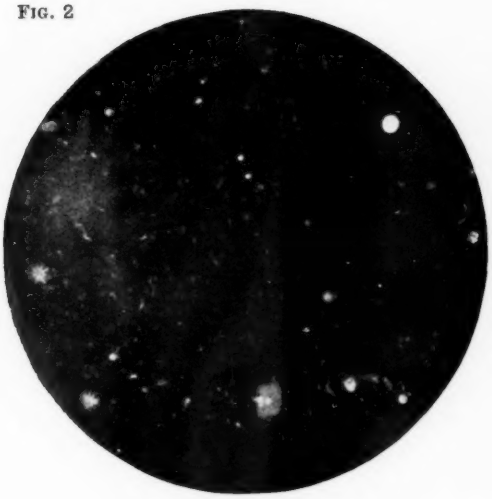


FIG. 5

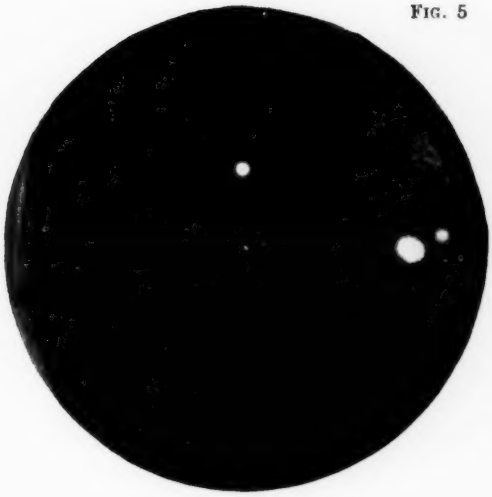


FIG. 3

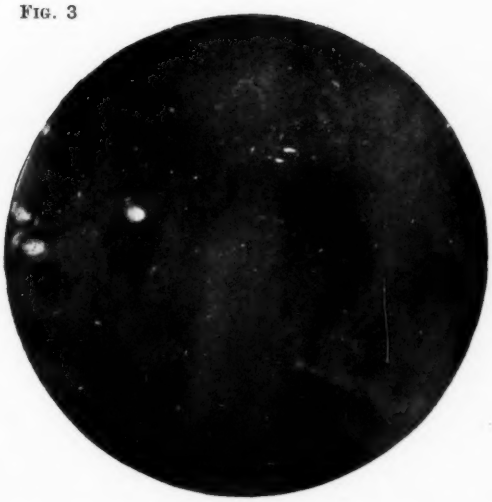


FIG. 6

TO ILLUSTRATE THE LANCET SPECIAL COMMISSION ON GLYCERINATED CALF VACCINE LYMPHS.

was made on July 9th, 1898. At the end of four days only four colonies had developed. On July 14th with one of the same batch of tubes a gelatin plate was made. From this ten colonies of actively motile and sporulating bacilli grew, but in addition to this organism 140 moulds developed. It was afterwards found that these moulds did not grow at the temperature of the incubator and therefore would not appear in agar plates. Had these moulds been few in number it might have been argued that they had come in accidentally after the tube had been opened, but they were so numerous that this explanation had at once to be set aside. On Sept. 14th a gelatin plate was made from the same batch of tubes; at the end of four days 13 colonies (Fig. 1) (a yellow torula-form organism and a spore-bearing motile bacillus) had grown. Although the spores of the penicillium are quite harmless to the tissues of the patient it is thought desirable to call the attention of those responsible for the collection, preparation, and storage of this lymph to what gives evidence of a flaw at some stage of the proceedings involved in the preparation of an otherwise admirable vaccine lymph.

Another batch of three tubes—No. 2967, dated Nov. 21st, 1898—gave even better results. On Dec. 6th only three colonies had developed at the end of four days on an agar plate; these consisted of a sporulating bacillus. On a gelatin plate not a single organism was found, but two or three anaerobic organisms made their appearance in the glucose-agar tube. This is an excellent lymph.

A third batch of three tubes, No. 1103, sent out on Jan. 30th, 1900, was plated out on Feb. 3rd. Four days later 235 colonies, principally staphylococci, had developed on the agar plate, 145 on the gelatin plate, and about 40 colonies, some of which gave rise to the formation of much gas, in the glucose-agar tube. This sample is not equal to the earlier ones, but is still much better than the average lymph supplied, and is above the standard set by the Local Government Board.

TABLE III.—*Experiments with Lymph from the Jenner Institute for Calf Lymph.*

Period of examination after the sample was sent out.	Number of colonies.		
	Agar plate.	Gelatin plate.	Glucose-agar tube.
First sample.			
4 days	4	—	—
9 ,, ...	—	10 + 140 moulds	—
1 ,, ...	—	13*	—
Second sample.			
15 days	3	0	2 or 3
Third sample.			
4 days	235	145	40 much gas.

* Plate from which Fig. 1 was photographed.

(2)

ANIMAL VACCINE ESTABLISHMENT,

UNDER THE SUPERVISION OF DR. CHAUMIER OF TOURS, AND 10, RUE DE LATRAN, PARIS.

By Special Appointment to various Departmental Authorities.

GOLD MEDAL OF THE PARIS ACADEMY OF MEDICINE, 1893.

"CALF LYMPH

In the form of liquid glycerinated pulp, concentrated and reinforced prepared under the most minute antiseptic precautions.

The activity of the vaccine from different animals varies greatly and is occasionally *nil*. This of itself constitutes a valid objection to direct calf-to-arm vaccination. Each sample of our vaccine is specially tested before being put up in tubes and samples which do not come up to the required standard of activity are thrown away. We reinforce the strength of the vaccine by a careful selection of the cultures and by employing for the inoculation of these cultures only pulp of extreme activity. For this reason all quoted vaccine invariably gives satisfactory results.

The calves from which the pulp is obtained are examined post mortem immediately after the lymph has been withdrawn.

The keeping properties of vaccinal pulp are very variable. In some instances we have kept specimens a whole year without marked detriment to their activity, but it is generally advisable to use the lymph within two months of its preparation, especially for revaccinating. Our tubes retain their full activity in hot climates."

Supplied in tubes for 25 persons, 1*s.* 3*d.* each, by Messrs. Roberts and Company, 76, New Bond-street, London, W.

Calf lymph marked No. 20, date 5/7/98. An agar plate containing the contents of one tube was poured on July 9th. At the end of four days 43 colonies of long bacilli had developed. On July 14th a gelatin plate was made from another tube, and from this 40 colonies developed; these consisted of a streptothrix and of sporulating motile bacilli. On Sept. 14th a second gelatin plate was made from the remaining tube, when 41 colonies (Fig. 2) were present on the fourth day; these consisted of the same species that were present in the other tube, the streptothrix and the sporulating organisms resisting the action of the glycerine. The vaccine from the bacteriological point of view had become stable or constant.

Another sample from the same source, No. 44, sent out on Nov. 19th, 1898, and plated on Dec. 6th, gave on an agar plate 32 colonies (among these was a staphylococcus); on the gelatin plate 13 colonies, four of them liquefying the gelatin, and in glucose agar three or four colonies had grown. This sample was of good quality; it contained very few organisms, and most of these were spore-bearing. The presence of a single staphylococcus colony was probably accidental; indeed, the seed organism may have crept in during the process of plating out.

A third batch from the same source, No. 138, was sent out on Jan. 30th, 1900. This was not so satisfactory as were those examined at an earlier date. It was plated out on Feb. 3rd or four days after it came from the agent. There were developed on the agar plates 1233 colonies, yellow sarcinæ and white cocci, 151 colonies on the gelatin plates, and at least 80 anaerobic colonies in the glucose-agar tubes. Here the numbers appear to be larger than they really are, as we are now dealing with an amount of vaccine that is to be used for eight vaccinations (one-third of contents of tube for 25 vaccinations). This batch, though still of fairly good quality, is not so satisfactory as were the earlier samples.

TABLE IV.—*Experiments with Dr. Chaumier's Calf Lymph.*

Period of examination after the sample was sent out.	Number of colonies.		
	Agar plate.	Gelatin plate.	Glucose-agar tube.
First sample.			
4 days	43	—	—
9 ,, ...	—	40	—
71 ,, ...	—	41*	—
Second sample.			
17 days	32	13	3 or 4
Third sample.			
4 days	1233	151	80

* Plate from which Fig. 2 was photographed.

(3)

FERRIS AND CO., BRISTOL.

Messrs. Ferris and Co. say that "all the lymphs we supply may be relied upon as *perfectly fresh*." Received six "half-tubes" (three for 2*s.* 6*d.*) "selected calf-lymph," No. C 6868, posted from Bristol on May 14th, 1898. On May 20th a gelatin plate was made from one of these small tubes. At the end of the fourth day there was no visible growth of any kind. On May 25th an agar plate was made; on the fourth day there were eight colonies present; these consisting (1) of staphylococci; (2) of short thick rods which were not identified; and (3) a streptothrix. On June 16th two plates were made from a tube, one half being added to gelatin and one half to agar; at the end of the fourth day each plate showed only a single colony. On Sept. 14th a tube was mixed with gelatin and made into a plate culture; at the end of four days four colonies (Fig. 3) were found, these all consisting of a yellow torula. From every point of view, then, this sample of vaccine lymph was eminently satisfactory, as it is quite possible that where a single colony was present and even where four were present—as they were all in a small group and were near the edge of the plate—this contamination may have been accidental. At any rate, it is necessary to give the manufacturers the benefit of the doubt. A second batch of similar small tubes (No. C 8605) was posted from Bristol at 6.30 P.M. on Nov. 21st, 1898, and on Dec. 1st a tube was added to an agar plate, one to a gelatin plate, and

one to a glucose-agar tube. At the end of four days the agar plate showed nearly 600 colonies, the more important organisms found being staphylococci, a streptothrix, a sporulating motile bacillus afterwards found to liquefy gelatin, and a short bacillus not identified, but which did not liquefy gelatin; on the gelatin plate there were seven colonies; in the glucose-agar tube 20 colonies. This sample is not so satisfactory as the first and, as the methods of preparation are necessarily the same, we must take the period that it has been kept into consideration, for if there is no difference in this period the variation must be due to access of organisms in larger numbers during the process of taking the lymph from the calf. The spore-bearing organisms would not, in any case, disappear.

A third sample of three "half-tubes" (each for one vaccination), No. C 12,196, was obtained. It was sent out on Jan. 30th, 1900, and was plated out on Feb. 3rd. Here the results were very satisfactory, only two colonies making their appearance on the agar plates, none on the gelatin plates, and four on the glucose agar. This sample of lymph may therefore be looked upon as of excellent quality as regards its bacterial contents.

TABLE V.—*Experiments with Calf Lymph obtained from Messrs. Ferris and Co., Bristol.*

Period of examination after the sample was sent out.	Number of colonies. Agar plate.	Gelatin plate.	Glucose-agar tube.
First sample.			
6 days	—	0	—
11 ,,	8	—	—
33 ,,	1	1	—
123 ,,	—	4*	—
Second sample.			
10 days	600	7	20
Third sample.			
4 days	2	0	4

* Plate from which Fig. 3 was photographed.

(4)

FAULKNER'S PURE RELIABLE GLYCERINATED CALF VACCINE LYMPH,

16, ENDELL-STREET, LONG ACRE, LONDON, W.C.

"Source, W.F.H., No. 627" (three tubes for 2*s.* 6*d.*), sent July 5th, 1898. "Most reliable and pure." "Guaranteed of exceptionally pure quality." "N.B.—The lymph will always be sent as soon as possible after receipt of order and Mr. F. cannot hold himself responsible for its safety after posting it, *nor from failure or any other effects when used.*" On July 9th an agar plate was made from one tube. After four days 500 colonies had developed; these consisted principally of staphylococci, the yellow torula, and of short thick oval bacilli. On July 14th a gelatin plate culture was poured from a second tube; in this there were present 952 colonies and three moulds. On Sept. 14th the third tube was mixed with gelatin and a plate poured; this contained 570 colonies (Fig. 4). These organisms consisted of the yellow torula already described; a red torula and a rose-coloured micrococcus; a leptothrix containing well-formed spores was also found in small numbers just as in the first and second tubes.

A second batch of lymph—also marked "Source, W.F.H."—was received on Nov. 21st, 1898. This was markedly superior to the other samples. An agar plate culture made on Dec. 1st and examined four days later contained only 35 colonies; these consisted principally of a short non-liquefying bacillus and one or two staphylococcus colonies. On the gelatin plate poured at the same time from another tube only three colonies developed and in glucose-agar four colonies.

A third sample of three tubes (white glass), marked "Source W. F., 315," was obtained on Jan. 30th, 1900, and plated out on Feb. 3rd. Here the results obtained were, comparatively, very unsatisfactory, no fewer than 4660 colonies developing on the agar plate, though only 29 appeared on the gelatin plates (in four days) and 140 anaerobic colonies in the glucose agar. The number of organisms, whatever may be their nature, appears to be excessive, especially as so many of them grow at the temperature of the body. This sample is certainly not nearly so good as were the earlier ones. Attention should be given to this matter.

TABLE VI.—*Experiments with Faulkner's Pure Reliable Glycerinated Calf Vaccine Lymph.*

Period of examination after the sample was sent out.	Number of colonies. Agar plate.	Gelatin plate.	Glucose-agar tube.
First sample.			
4 days	500	—	—
9 ,,	—	952	—
71 ,,	—	570* + 3 moulds	—
Second sample.			
10 days	35	3	4
Third sample.			
4 days	4660	29	140

* Plate from which Fig. 4 was photographed.

(5)

DR. WARLOMONT'S GLYCERINATED CALF VACCINE.

AGENT: MARKT BROS. AND CO., 38 & 39, BEECH-STREET BARBICAN, LONDON, E.C.

Sent July 5th, 1898 (three tubes, No. 7). It is claimed for this preparation that "every antiseptic precaution [is] most carefully observed."

"Strict antiseptic precautions are employed throughout its production and the preparation is carried on under conditions to secure the strictest cleanliness in sterilised and accurately closed amber glass tubes or vials.

The medical profession has always greatly valued Dr. Warlomont's glycerinated calf vaccine and consider as one of its chief qualities the absence of the severity of the ordinary calf vaccine.

We always advise to use our vaccine fresh, but we can at the same time guarantee that it will retain its activity for a considerable but indefinite and variable time if kept unopened and in a cool place.

The vaccine we supply has always been tested before sending out which must be considered as a guarantee of its activity and its mild character.'

An agar plate made on July 9th contained 65 colonies, consisting principally of long bacilli, a yellow torula, and staphylococci. A gelatin plate made on July 14th developed 28 colonies. On Sept. 14th a third tube was plated out in gelatin, when only eight colonies (Fig. 5) made their appearance; these colonies consisted of a yellow torula-form organism, of a sporulating bacillus apparently belonging to the subtilis group, and of streptococci.

A second example from the same source—date Nov. 21st, 1898, No. 21—was not of so satisfactory a character. An agar plate poured on Dec. 1st developed 880 colonies, consisting of staphylococci, sporulating bacilli, a leptothrix, a streptothrix, and a short thick motile bacillus; on the gelatin plate there were 32 colonies, every one of which liquefied the gelatin; in the glucose-agar tube six anaerobic organisms made their appearance. It is quite possible that these samples had been well prepared and glycerinated, but that the process had not been allowed to continue for a long enough time.

A third batch of three half-tubes (amber glass), No. 45,

TABLE VII.—*Experiments with Dr. Warlomont's Glycerinated Calf Lymph.*

Period of examination after the sample was sent out.	Number of colonies. Agar plate.	Gelatin plate.	Glucose-agar tube.
First sample.			
4 days	65	—	—
9 ,,	—	28	—
71 ,,	—	8*	—
Second sample.			
10 days	880	32	6
Third sample.			
4 days	1969	30	115

* Plate from which Fig. 5 was photographed.

each tube containing sufficient lymph for one vaccination, was obtained on Jan. 30th, 1900, and plated out on Feb. 3rd. The following were the results obtained. On the agar plate 1969 colonies developed, principally a yellow sarcina and a coccus; on gelatin 30, and in glucose agar 115 colonies made their appearance. This, again, is scarcely a satisfactory result.

(6)

ESTABLISHMENT FOR VACCINATION WITH CALF LYMPH, 186, MARYLEBONE ROAD, LONDON, N.W.

Three small tubes, No. 3744 (price 2*s.* 6*d.*), sent by Charles Renner, July 5th, 1898, with the request, "Please use it as soon as possible." Along with this lymph is a statement from which the following extracts may be quoted.

"The advantages of calf vaccine over human lymph may be thus briefly stated:

I. The danger of imparting infectious and other diseases, the most important and well-founded objection to vaccination from human beings, is absolutely avoided.

II. On the other hand, there is no fear of communicating any disease from which the calf may suffer. For of these very few only are at all transferable to man and are so easily discovered that no calf suffering from any of them is likely to be received for vaccination. The health of every organ of the vaccinifer is ascertained post mortem by an experienced veterinary surgeon before any of its lymph is used.

III. Erysipelas, the most dreaded disease which sometimes follows vaccination, is of very rare occurrence after vaccination with animal lymph and is never directly caused by well-prepared calf vaccine. In several cases of inflammation or ulceration which have been reported the true cause has been discovered in subsequent infection or in defective sanitary surroundings of the patients. (In all such cases the drainage of the house should be examined.) In others, excessive size of the insertions was responsible for too severe local reaction.

IV. This calf lymph does not produce more, but rather less, inflammation than human lymph; while failures * are quite exceptional and are generally due to some accidental occurrence, provided it is properly and skilfully used. The areola often forms later in the case of calf lymph and the scabs adhere for a longer time. In some cases the incubation stage is prolonged, sometimes considerably. This should be remembered before pronouncing a failure.

Dr. Renner's calf vaccine is prepared with glycerine under scrupulous observation of efficient methods of sterilisation of everything coming in contact with it. The result is a pure vaccine culture, free from extraneous germs, which can produce nothing but pure vaccinia and presents a turbid appearance owing to the large quantity of minutely subdivided granular tissue and the cells which it contains. These, and not the clear liquid, are the active parts of the vaccine vesicle. The presence of a little blood is quite harmless.

If once opened the tube should be used forthwith, as after exposure to the air the lymph loses its efficacy.

In unopened tubes the lymph keeps well for a considerable but indefinite time, provided it is kept protected from heat and light."

"* Failures, as reported, have for many years past not exceeded a fraction of 1 per cent."

On July 9th an agar plate was made, when only four colonies made their appearance, these consisting of long bacilli and a torula. On July 14th a gelatin plate was made from one of the tubes; after four days 27 colonies were found, very similar to those above described. On Sept. 14th 13 colonies were found on the fourth day on a gelatin plate; these consisted of a yellow sarcina, a sporulating bacillus, and a streptothrix; here, again, the streptothrix appeared to withstand the action of the glycerine along with the other organisms present.

Another sample from the same source—No. 40180—sent on Nov. 21st, 1898 (three small tubes, price 2*s.* 6*d.*), was tested on Dec. 12th. This was a very different lymph from the previous sample, as the organisms which developed from it on the agar plate on the fourth day were uncountable. They consisted of staphylococci and motile sporulating bacilli; the gelatin plate made on the same day contained 45 colonies (similar organisms), all of which liquefied the gelatin; this sample was also unsatisfactory from the fact that the glucose-agar tubes with which it was mixed developed 60 anaerobic colonies.

The third sample of lymph (No. 54330) gave excellent results. Only two colonies appeared on the agar plate, two on the gelatin plate, and four in the glucose agar tube. From a bacteriological point of view this sample may be looked upon as being altogether unexceptionable. If such lymph retains its full activity and if such results can be attained regularly the question of pure lymph is one that need no longer trouble the public. This is, of course, in marked contrast to sample No. 2 and affords evidence that greater care is now taken in the preparation and storage of this lymph than was the case even a year and a half ago.

TABLE VIII.—*Experiments with Lymph from Dr. Renner's Establishment for Vaccination with Calf Lymph.*

Period of examination after the sample was sent out.	Number of colonies.		
	Agar plate.	Gelatin plate.	Glucose-agar tube.
First sample.			
4 days	4	—	—
9 "	—	27	—
71 "	—	13	—
Second sample.			
21 days	Uncountable.	45	60
Third sample.			
4 days	2	2	4

(7)

THE ASSOCIATION FOR THE SUPPLY OF PURE VACCINE LYMPH, 12, PALL-MALL EAST, LONDON, S.W.

Eight whole tubes (amber glass) were received on May 16th, 1898. These were marked: "Date, May 12th, 1898 To be used before 30/5/98. Emulsion of pure calf vaccine." No. 2702. "Pure and reliable."

"*The durability of its activity*, which our special trials enable us to estimate, is given upon the back of each cell bearing our trade mark, and, although a margin beyond that date may exist, no complaints of failures can be entertained if the vaccine is used after that date.

Storing.—Until required for use vaccine should always be kept in the coldest place available.

During the whole of last year only 0·91 per cent. of the vaccine from the second [the present] source was reported to have failed."

On May 20th a gelatin plate was made from one of the tubes; after four days 3200 colonies had developed on this plate, some of the colonies, mostly of a yellow colour, consisted of rods, others of staphylococci; there were also present a number of moulds (penicillia). On May 25th another tube was mixed with agar and a plate culture poured; only about 120 colonies made their appearance on this plate; the organisms again were staphylococci and flagellated bacilli. On June 16th, or little more than a month from May 12th and a fortnight after the date at which the vaccine was to be used, two plates were made, one on gelatin and a second on agar; the agar culture now contained only six colonies, the gelatin 13, of which three were moulds. On Sept. 14th another tube of the same batch was mixed with gelatin and a plate poured; only five organisms (Fig. 6) were found—one of these was a streptothrix, one a torula, and the others were bacilli.

A second sample from the same source, dated Nov. 21st, 1898, to be used before Dec. 5th, 1898 (No. 6083), was examined on Dec. 6th, 1898. The agar plate at the end of four days contained such an enormous number of organisms that they were uncountable. These organisms consisted of staphylococci and non-motile bacilli; the staphylococci were very active, liquefying gelatin somewhat rapidly. On the gelatin plate the number of organisms was very small, only 13. Here the extraordinary number of colonies developed

TABLE IX.—*Experiments with Lymph from the Association for the Supply of Pure Vaccine Lymph.*

Period of examination after the sample was sent out.	Number of colonies.		
	Agar plate.	Gelatin plate.	Glucose-agar tube.
*First sample.**			
8 days	—	3200 + moulds.	—
13 "	120	—	—
35 "	6	10 + 3 moulds.	—
125 "	—	5†	—
Second sample.			
15 days	Uncountable.	13	10
Third sample.			
4 days	1580	37	64

* This sample is marked "Date, May 12th, 1898, to be used before May 30th, 1898"; the second sample was dated "Nov. 21st, 1898, to be used before Dec. 5th, 1898."

† Plate from which Fig. 6 was photographed.

at the temperature of the body should be noted. In glucose-agar a number of anaerobic organisms developed.

Neither of these samples can be looked upon as satisfactory. Whatever may be the reason of the large number of organisms present to begin with, the bulk of them should have disappeared by the time that these plates were made, as all were made near to or after the time beyond which it was recommended that the lymph should not be used.

A third batch of three half tubes, "P, No. 500, to be used before Feb. 15th, 1900," was obtained on Jan. 30th, 1900, and plated out on Feb. 3rd with the following results. The agar plate contained 1580 colonies, the gelatin plate 37, and the glucose agar tube 64 anaerobic growths or colonies. This is better than sample No. 2, but is still somewhat unsatisfactory from a bacteriological point of view.

SAMPLES EXAMINED TWICE ONLY.

A number of samples were also examined on two occasions only. These were plated out on agar and gelatin and were also grown in glucose-agar in order that we might determine whether any anaerobic organisms were present or not.

(8)

GLYCERINATED CALF VACCINE LYMPH FROM THE INSTITUT DE VACCINE ANIMALE, PARIS.

DIRECTEURS: E. CHAMBON AND DR. ST.YVES-MÉNARD.

AGENTS FOR THE UNITED KINGDOM AND COLONIES: THE MEDICAL SUPPLY ASSOCIATION, 12, TEVIOT-PLACE, EDINBURGH.

Sent out from the agency at 228, Gray's-inn-road, London, W.C., Nov. 21st, 1898. "This glycerinated calf vaccine lymph is contained in sterilised tubes. It should be kept in a cool place." "The two-shilling tube contains sufficient for twenty vaccinations." "The whole contents of the tube should be used at one time." With the contents of one tube an agar plate was made and poured on Dec. 6th, with the result that at the end of four days only 16 colonies (or less than one per vaccination) made their appearance and these were all organisms which strongly resist the action of glycerine—a streptothrix, a sporulating bacillus, and sarcina flava; on the gelatin plate similarly prepared three colonies developed; and the glucose-agar tube contained only a couple of colonies of anaerobic organisms. This is a lymph of extraordinary bacterial purity.

A second sample marked as being collected on Jan. 9th, 1900, and containing sufficient material for 20 vaccinations was obtained on Jan. 30th and plated out on Feb. 3rd, with the following results. Material for about seven vaccinations mixed with agar gave 378 colonies. On the gelatin plate 433 colonies, principally yeasts with a few white cocci, were developed and in the glucose-agar 32 anaerobic colonies. When it is remembered that here we are dealing with a large quantity of material (sufficient for about seven vaccinations) the results may be said to be very satisfactory though not quite equal to those obtained at the first examination. The fact that so many of the colonies developed at the temperature of the room indicates that they are probably derived from external sources—i.e., they are organisms that are not likely to be pathogenetic.

TABLE X.—*Experiments with Lymph from the Institut de Vaccine Animale, Paris.*

Period of examination after the sample was sent out.	Number of colonies.		
	Agar plate.	Gelatin plate.	Glucose agar tube.
First sample.			
15 days	16	3	2
Second sample.			
4 days	378	433	32

(9)

GLYCERINATED CALF LYMPH, "PURE CULTURE BRAND," S. MAW, SON, AND THOMPSON, 7–12, ALDERSGATE-STREET, LONDON, E.C.

Batch G.L. 36. Date of preparation, Oct. 21st, 1898. Insertion success 100 per cent. Posted Nov. 21st, 1898.

"This lymph is guaranteed to be free from all disease germs and is prepared in the country under the supervision of a bacteriological expert ..... and guaranteed to be absolutely aseptic and free from all disease germs.

Glycerinated lymph is now strongly recommended by the Local Government Board and it has an additional advantage over other lymph in that it will retain its properties and continue to improve for a period of at least 10 months."

Three 1*s.* tubes were used. One was added to agar and a plate poured on Dec. 6th. After four days' growth 145 colonies, which consisted entirely of a sporulating bacillus and a streptothrix, both of which resist the action of glycerine, had made their appearance. The gelatin plate contained 45 colonies; of these five liquefied the gelatin; the organisms present consisted principally of a sporulating bacillus. In the glucose-agar tube only three or four colonies could be seen. This sample of lymph had evidently been carefully glycerinated and if any fault at all could be found with it the criticism must be that it might possibly have been collected with somewhat greater care in order that the sporulating organisms, bacillus and streptothrix, which are evidently very numerous wherever calves are housed and their food is stored, might be kept out of the preparation.

The second batch of this lymph, three tubes (yellow glass) marked G. L. 59, was obtained on Jan 30th, 1900, and was used on Feb. 3rd. Agar plates kept under observation showed no fewer than 3410 colonies, gelatin plates 3560 colonies, and glucose agar tubes 340. This sample contained orange cocci in considerable numbers; these developed at the temperature of the body and certainly should not be present in a glycerinated lymph. The sample is not nearly so satisfactory as that obtained more than a year ago and more attention should at once be given to the methods by which it is collected, prepared, and stored. This lymph had a red tinge. Note the number of organisms growing at the temperature of the body and the large number of anaerobic organisms in this sample.

TABLE XI.—*Experiments with Lymph from Messrs Maw, Son, and Thompson—"Pure Culture Brand."*

Period of examination after the sample was sent out.	Number of colonies.		
	Agar plate.	Gelatin plate.	Glucose agar tube.
First sample.			
15 days	145	45	3 or 4
Second sample.			
4 days	3410	3560	340

(10)

BIRMINGHAM CALF LYMPH VACCINATION ESTABLISHMENT, 204, VICTORIA-ROAD, ASTON, BIRMINGHAM.

JOHN ROUND, L.R.C.P. EDIN., DIRECTOR.

Three large tubes each for four vaccinations, 2*s.* 6*d.*, and one small tube for one vaccination, 6*d.* Source, 981,110. Samples sent from Birmingham Nov. 21st, 1898.

"The enclosed vaccine must be kept in a cellar or some other cool place, as *glycerinated calf vaccine* will not stand a temperature equal to summer heat for any great length of time."

The larger tubes were used and an agar plate was made on Dec 6th, 1898, when 345 colonies made their appearance on the agar plate. This in itself is not an excessive number and does not represent the real character of the lymph, but indicates that the period of exposure of the organism to the action of the glycerine was probably too short, or that the glycerine was not strong enough, as a large number of the colonies consisted of staphylococci, which are usually killed off in the glycerine conserves. A short motile bacillus in which spores could but rarely be demonstrated was present in small numbers only, but it would probably have persisted through any treatment. It is important to note that on a gelatin plate made with one of these tubes no growth of any kind made its appearance, whilst in a glucose-agar tube only a couple of colonies of anaerobic organisms developed. With this sample a useful addressed return post-card for the entering up and returning of the results obtained is sent out. On this should be noted "The Source of Lymph," "Date when Used," "Number of Insertions Made," "Number of Vesicles Produced," "Remarks." If the director of the establishment has kept a careful record of these returns he should now have at his command a mass of very valuable data.

A second sample, three large tubes (green), labeled

"Source 1101," was obtained on Jan. 30th, 1900, and plated out on Feb. 3rd with the following results. An agar plate gave 32 colonies only, the gelatin plate 91, and the glucose agar tube 72. This is marked improvement even on the sample taken about 14 months earlier, but the anaerobic organisms should if possible be still further reduced in number by more careful preliminary manipulation, as the glycerine appears to be doing all that it could be expected to accomplish. Most if not all of the organisms that remain are spore-bearing organisms or the yellow torula that appears to resist the action of the glycerine.

TABLE XII.—*Experiments with Lymph from the Birmingham Calf Lymph Vaccination Establishment.*

Period of examination after the sample was sent out.	Number of colonies.		
	Agar plate.	Gelatin plate.	Glucose-agar tube.
First sample.			
15 days	345	0	2
Second sample.			
4 days	32	91	72

(11)

PURE CALF VACCINE FROM DR. HIME'S CALF VACCINE INSTITUTION,

54, HORTON-ROAD, BRADFORD.

"As supplied to the Government in England, the Government in Ireland, the Egyptian army, boards of guardians, town and county councils, asylums, prisons, public vaccinators, &c. Vaccination of calves and collection of vaccine under strict antiseptic precautions. Tubes, &c., sterilised before use."

The sample used was not dated but was received on Nov. 22nd or 23rd, 1898. Tubes, 1*s.* each. The contents of one tube were mixed with agar and plated out in the ordinary way on Dec. 1st, 1898. At the end of four days 192 colonies had made their appearance. Amongst the organisms examined were a streptothrix, a motile sporulating bacillus, and a staphylococcus. On a gelatin plate culture made in the same way 45 similar colonies developed and in the glucose-agar 50 anaerobic organisms developed into colonies. It is possible that in this case the lymph had not been exposed to the action of the glycerine for a sufficiently long period; otherwise no staphylococci should have been present. These staphylococci, however, were decidedly enfeebled, as they did not grow with anything like the vigour that usually characterises the growth of this organism. No streptococci were found. The presence of the organisms from which colonies developed appeared to be attributable to slight defects in the method of collection of the lymph and to some defect, also slight, probably too short a time, in glycerination.

A second sample (yellow glass) of this lymph was obtained on Jan. 30th, 1900. It appeared to be of good colour and was altogether an excellent-looking sample. It was in all respects superior to the sample obtained more than a year ago except that the number of anaerobic organisms developed in the glucose-agar was too high. The process of glycerination has, however, been well carried out, as is evident from the comparatively small number of colonies that made their appearance on the agar and gelatin plates. The following were the results obtained: on the agar plate, 14 colonies developed; on the gelatin plate, 4; in the glucose-agar tube, 90.

TABLE XIII.—*Experiments with Lymph from Dr. Hime's Calf Vaccine Institution, Bradford.*

Period of examination after the sample was sent out.	Number of colonies.		
	Agar plate.	Gelatin plate.	Glucose-agar tube.
First sample.			
8 (or 9) days	192	45	50
Second sample.			
4 days	14	4	90

(12)

THE REBMAN PUBLISHING COMPANY,

129, SHAFTESBURY-AVENUE, CAMBRIDGE-CIRCUS, LONDON, W.C.

A sample of vaccine lymph was received from this firm on Nov. 22nd, 1898, and was marked "No. 567; 3 @ 1/-; 21. XI. 98." With one of the tubes an agar plate was made on Dec. 1st. After four days' growth 320 colonies, which comprised a rose-coloured micrococcus, very small, similar to that seen in other samples, a staphylococcus, a yellow sarcina, along with a number of short non-motile bacilli, had developed. On the gelatin plate there were 15 colonies. In the glucose-agar tube 50 colonies had grown. Some of the organisms present in this specimen should have been eliminated by the glycerine.

A second sample of lymph (No. 102), contained in three tubes, was obtained on Jan. 30th, 1900, and was plated out on Feb. 3rd with the following results. On the agar plate 4070 colonies developed; on the gelatin plate 48 colonies of aerobic organisms, hay bacillus, potato bacillus, and cocci; and in the glucose-agar tube 220 colonies of anaerobic organisms. This result is far from satisfactory; it may be due to imperfect glycerination, to some want of care in collection, or even to both of these causes.

TABLE XIV.—*Experiments with Lymph from the Rebman Publishing Company, London.*

Period of examination after the sample was sent out.	Number of colonies.		
	Agar plate.	Gelatin plate.	Gluco-e-agar tube.
First sample.			
10 days	320	15	50
Second sample.			
4 days	4070	48	220

In order to have some basis for comparison and to obtain a standard which manufacturers might reasonably also be expected to attain to by careful collection and glycerination half a dozen tubes of the Local Government Board lymph were procured on Feb. 6th, 1900, and plate and other cultivations were made at once from three of the tubes. On the agar plate 258 colonies developed, on the gelatin plate four, and in the glucose-agar tube 20 colonies.

TABLE XV.—*Experiments with Lymph from the Local Government Board Laboratories.*

Period of examination after the sample was sent out.	Number of colonies.		
	Agar plate.	Gelatin plate.	Glucose-agar tube.
One sample only.			
4 days	253	4	20

The contents of one of these tubes being found to weigh 0·05 gramme the above numbers and this weight were taken as the standards with which to compare the other lymphs examined. The tubes in which the makers supply their lymph vary very greatly in size and the quantity of vaccine lymph contained in each varies in a corresponding degree. In order to obtain accurate data for comparison the contents of one of the tubes obtained from each maker or agent were weighed and the number of organisms in each unit of weight, 0·05 gramme, calculated out. These results are set forth in the following table in which the standard lymph, Local Government Board, is printed in black letter. Those who take an interest in this question may construct for their own use a corresponding table for the vaccines examined at the earlier dates. These are the results obtained with the vaccines as at present sent out, and are given to show the point to which practice and experience have brought the various purveyors of vaccine lymph who now supply the market.

TABLE XVI.—*Vaccine Lymph. Relative Bacterial Purity of Samples received during the Last Week of January, 1900. Number of Colonies present per 0·05 Gramme are here calculated out for Purposes of Comparison.*

Source of vaccine lymph.	Weight of material used for experiment.	Number of colonies per 0·05 gramme.		
		Agar plate.	Gelatin plate.	Glucose-agar tube.
	Grammes.			
1. Dr. Renner's Establishment for Vaccination with Calf Lymph	0·046	2	1(?)	2
2. Messrs. Ferris and Co., Bristol	0·07	2	0	3
3. Dr. Hime's Calf Vaccine Institution, Bradford ...	0·07	10	3	64
4. Birmingham Calf Lymph Vaccination Establishment	0·042	38	108	85
5. Institut de Vaccine Animale, Paris	0·125	151	173	13
6. Jenner Institute for Calf Lymph	0·05	235	145	40
7. Local Government Board	0·05	258	4	20
8. Dr. Chaumier (Animal Vaccine Establishment), Paris	0·107	576	70	37
9. Association for the Supply of Pure Vaccine Lymph, 12, Pall Mall East	0·053	1490	35	61
10. Dr. Warlomont's Glycerinated Calf Vaccine ...	0·044	2237	34	131
11. "Pure Culture" Brand, S. Maw, Son, and Thompson	0·06	2841	2966	283
12. The Rebman Publishing Company	0·065	3130	37	169
13. Faulkner's Pure Reliable Glycerinated Calf Vaccine Lymph	0·034	6882	42	206

REMARKS.

Whenever a large number of staphylococci remained in the lymph at the time that the plates were made the period of glycerination had not been sufficiently prolonged. In one case we had ample evidence of this, as on the eighth day there were 3200 colonies, mostly staphylococci, on the gelatin plate; on the thirty-fifth day this number had fallen to 10 and on the one hundred and twenty-fifth day to five, so that, although the lymph was not what could be called a satisfactory lymph at the time that it was sent out, the method of preparation was apparently good and the number of organisms had been brought to what may be held to be a normal level at the end of five weeks and probably before that period. Such a result as this was to be expected, as until the full force of public opinion could be brought to bear on the manufacturers of vaccine the fact that a lymph gave 100 per cent. of successful insertions would carry far more weight in deciding whether a lymph should be sent out or not than the mere presence or absence of a certain number of organisms. As a matter of fact, most of these organisms, or at any rate such as could be examined, were staphylococci, and although they were probably ordinary skin staphylococci we cannot blind ourselves to the possibility that such organisms might be of a noxious character.

SIGNIFICANCE OF VARIATION IN BACTERIOLOGICAL PURITY.

Where the number of organisms in any sample is high it must be assumed, not that they are necessarily so in other samples of the same brand, but that the numbers probably vary in different samples. Certain samples have been tested and found to be free from, or to contain a comparatively small number of, micro-organisms; others treated in apparently exactly the same way, but perhaps not collected with the same amount of care, have been accepted as being equally free from any considerable number of organisms, but they have been found to contain considerable numbers. This is an important point, for where these organisms are present in large numbers it must be assumed that those special samples have not been bacteriologically examined before they were put on the market, and although the organisms themselves may be of insignificant importance and may be quite incapable of acting pathogenically we have evidence that a sufficiently careful look-out is not being kept. Under such conditions slight flaws and irregularities will not be easily detected, and the danger of a bad sample of lymph (from the bacteriological point of view) coming into use will not be fully guarded against. It is from this standpoint that we wish to call attention not only to those lymphs in which the number of micro-organisms is high but also to those in which it varies most, in order that those who are responsible for their production may bring them into line as regards bacterial purity with the best supplies on the market.

IMPORTANCE OF CARE AND CLEANLINESS IN THE PRELIMINARY PROCESSES.

After examining these various lymphs we have come to the conclusion that most of those who are engaged in the preparation of vaccine lymph are fully impressed with the necessity for careful glycerination, but we are not satisfied that the necessity for preliminary cleanliness and antiseptic precautions accompanying the preparation and collection of the lymph is equally fully appreciated or, at any rate, allowing that it is appreciated, that these precautions are always carried out in detail. Where so much has to be left to stable-keepers and assistants, who, in the first instance at any rate, can have no idea of the great importance of attending to the minute details essential to success in the preparation of pure lymph, the most constant care is required on the part of managers and directors. Although we are of the opinion that the heads of departments are thoroughly competent to carry out this work themselves we are convinced that in one or two instances, owing perhaps to imperfect supervision, vaccine lymph has been allowed to be put into circulation which, though perfectly satisfactory in its action and probably sufficiently carefully selected to do its work properly, does not come up to the standard of good glycerinated lymph, which should contain none but spore-bearing organisms and these in very small numbers. The bedding of calves, of course, contains numerous spore-bearing bacilli and these may readily find their way into vaccine unless the greatest care is taken in collecting it and in keeping out dust during the process of preparation. Of these spore-bearing organisms a certain proportion are anaerobic and can only be grown under anaerobic conditions, as, for example, in glucose-agar tubes.

THE STANDARDS BY WHICH A LYMPH SHOULD BE JUDGED.

The following are some of the features that should characterise a fairly good lymph. Any lymph which fails in any of these points should be looked upon as not being perfectly satisfactory, and we should suggest that medical men who have trouble with their lymph should make inquiries on the points here suggested. Of course, each vaccinator soon finds out for himself with what brands he obtains the most consistently successful insertions, and on this matter it is easy enough for him to satisfy himself; but for those who are commencing or who desire to determine which is the best vaccine of a series the following notes may be of some assistance.

DO "SEASONAL VARIATIONS" OCCUR?

It has been suggested that the period of the year at which the vaccine is taken has something to do with the activity of the vaccine; it has also been maintained that vaccinations done in hot weather, even from lymph taken during cold weather, are not so efficient as those done in cold weather. We have made inquiries on this point, and although it is exceedingly difficult to get very definite statistics we are satisfied that, given a healthy condition of the animal and an active virus to begin with, there is no difference that need enter into the calculations of those supplying and using vaccine lymph. It should be pointed out, however, that during warm weather calves appear to be much more subject to intestinal troubles and to slight or even marked variations of temperature, and it appears to be the general experience that it is unwise to use the vaccine from animals thus affected: first, because of the altered condition of the tissues during the febrile attacks, and therefore the altered reaction to the vaccine lymph; and secondly,

because under these conditions micro-organisms are not only more rapidly developed in and near the animal, but also because it is more difficult to keep them under control where the secretions are materially altered. These organisms making their way into the lymph cause a rapid deterioration of the vaccine and render its purification much more difficult. The season itself, then, need not be taken into consideration except in so far as it affects the health of the calf. Still dealing with the animal, we should recommend that no vaccine lymph be used until a post-mortem examination has been made by a veterinary surgeon accustomed to make these examinations and until he has declared the animal to be free from tuberculosis or any other infective disease. Here the injection of tuberculin beforehand might give information as to the presence or absence of tuberculosis, but as these calves are usually killed very shortly after the vaccine lymph has been taken and before it is distributed there is every facility for making, and therefore every reason to insist upon, a post-mortem examination and the definite certification that such an examination has been made.

MACROSCOPIC IMPURITIES.

As it is impossible for any medical man to inspect vaccine establishments for himself and to see that everything is done with antiseptic precautions and under cleanly conditions, he must rely to a very great extent upon the bacteriological examination of the lymph for evidence on these points. A little blood is in itself in the case of calf lymph no impurity, but we should prefer to have the blood absent, not only from the æsthetic point of view, but also from the point of view that the absence of blood indicates a certain amount of care in collection. In one of the samples examined by us hairs of considerable length were found, which would indicate that the shaving had not been carried out sufficiently well in the first instance, and with shaving badly carried out thorough cleansing is impossible, the alternative interpretation of the presence of hairs being that they came from uncleansed portions of the animal and had—through inadvertence no doubt—been allowed to make their way into the pulp. The hairs in themselves are not harmful, but their presence indicates that certain precautions have not been taken. The number of micro-organisms that may cling to hairs may, however, sometimes be very great indeed. A point on which all practitioners should insist is that the date of glycerination as well as the dates between which the makers recommend that the lymph should be used should be given with every sample of vaccine lymph which they receive. Of some of the samples examined we should say—from our experience of them at different periods—that when they came to us they had not been subjected to the action of the glycerine for a sufficiently long period; and it should be possible for those who wish to examine the lymph to determine whether the excess of organisms is due to imperfect or insufficiently prolonged glycerination or whether it is due to flaws in the methods of collection and preparation.

METHOD AND INTERPRETATION OF BACTERIOLOGICAL EXAMINATION.

In these days, when most practitioners have a knowledge of the elements of bacteriology, it is practicable for almost everyone to determine for himself whether a lymph is suitable for his purposes or not, receiving a certificate from the maker that the vaccine lymph when fresh or when freshly glycerinated gives from 95 to 100 per cent. of successful insertions, that the glycerination took place on a certain date, and that the calf from which the lymph was taken was free from tuberculous or other infective disease. All he need do is to test a tube now and again in the following fashion. From any of the bacteriological apparatus makers obtain half-a-dozen pairs of Petri's flat glass dishes; boil them thoroughly in pairs on two or three occasions, then wrap up each pair in clean hard white paper and put them into the kitchen oven, leaving them there until the paper gets a slightly yellow tinge, then wrap the whole parcel in another piece of clean paper and put aside until required for use. From any bacteriological supply agent obtain two or three tubes each of nutrient gelatin, nutrient agar, and of 2 per cent. glucose-agar and make cultivations as described on p. 1228 If the vaccine lymph has been carefully collected and the glycerine has been allowed to act for a month, the number of organisms growing in any of these media should be small. If the number growing is very large, that is, if it runs up to anything like 500 in the vaccine for a single inoculation, we suggest that the maker should be apprised of the fact that the glycerination is not being properly carried out and that any stock of lymph should be returned. When the number is not so large, 200 or 300 say, an examination should at once be made for the presence of spore-bearing organisms; this can very easily be done by heating the tubes containing the mixture of nutrient medium and vaccine to a temperature of 60° C. for one hour or to 80° C. for 10 minutes; this will kill off all but the spore-bearing organisms. The plates should then be poured and examined at the end of four days. If the number of colonies developed on each plate falls very greatly the maker should be communicated with and the practitioner will be wise if he does not use the lymph. It may be sound, and probably is, but he will feel justified in refusing to accept the responsibility of using a lymph in which the presence of non-spore-bearing organisms suggests not only a lack of care, of cleanliness, or of strict antiseptic precautions, but also of imperfect glycerination.

EFFECT OF GLYCERINATION ON VESICULATION AND PUSTULATION.

It has frequently been noted that vaccine lymph that has been subjected to the action of glycerine appears to produce vaccine vesicles which arrive at so-called "maturity" at a somewhat later period than do the vesicles produced by the ordinary lymphs. This appears to us to have a bearing on certain facts that have been put forward in connexion with the production of, or failure to produce, immunity by vaccine lymph. The fact may be recalled that in cases of herpes staphylococci, and even streptococci, have frequently been described as the causal agents of first the vesicles and then of the pustules that are produced in that disease. Of course, it now appears to be fully recognised that the production of a vesicle is due to the rapid action of a stimulating substance which promotes the exudation of a clear fluid, accompanied by a certain number of leucocytes, into the spaces in and immediately under the cuticle. This irritant may be of various kinds. It may consist of the products of micro-organisms or it may be the active principle of cantharides, or, again, it may be, as in the case with which we have here to deal, the specific organisms associated with the vaccine lymph. After a time the lymph becomes more cloudy, from an increase in the number of leucocytes, whilst it is only later, when apparently the micro-organisms of the skin, especially the pus-producing organisms which are so frequently found there, begin to exert their chemiotaxic plus a necrotic effect that the true pustule is formed. In vaccination the pustulation seems to be due entirely to the action of these pyogenic organisms, so that the fewer of these there are in the lymph and the cleaner the vaccinated surface is kept the longer will be the stage of vesiculation (and probably the greater the protection afforded) and the later the appearance of pus-formation. In fact, if the pus organisms could be kept out of the vesicle altogether there is no reason to doubt that true scabbing might occur without the intervention of suppuration of any kind, the vesicle drying up to form a scab which would protect for a time the irritated surface beneath it. We have ample demonstration of the fact that the presence of pus-producing organisms in vaccine lymph may not greatly interfere with the characteristic appearance of the vaccine vesicle, though there is always a tendency to the production both of vesiculation and of pus at a comparatively early stage, the period of vesiculation being somewhat shortened. It must be insisted upon that vesiculation and pustulation—not, of course, with the characteristic appearances of the true vaccination vesicle, but with a superficial likeness that is not always differentiated except by the very careful observer—may lead those who are not on the look-out for this spurious condition to assume that, because they have had such spurious vesicle and pustule following the scratching of the skin and the rubbing in of a supposed vaccine lymph, they have had a successful insertion; with the result that it has been claimed that cases vaccinated successfully have been shortly followed by successful revaccination in which the appearances have been perfectly typical, the fact being that the supposed primary vaccination was nothing more than vesiculation and pustulation, *not* of the true vaccine type, but with sufficient superficial resemblance thereto to be capable of deceiving the unwary.

That the proper vaccine organism exerts a very distinct

action on the skin—the histological changes are well described in Dr. Copeman's Milroy Lectures[4]—is now fully recognised, and the more active the vaccine the wider the area beyond the scarification in which the reaction and vesiculation take place. It must be remembered, however, that a second factor in determining the extent of this vesiculation is the depth of the scarification, and a weak lymph with a deep scarification may in some instances give as extended a reaction and as marked and large a vesiculation as a stronger vaccine applied to a more superficial scarification. Speaking generally, however, the first statement holds good. Moreover, as has already been mentioned, the most typical vesiculation, but one running a somewhat slow course, is obtained by means of vaccine lymph that contains no "extraneous" organisms or only a few of the innocuous spore-bearing organisms above mentioned. In connexion with this statement it must be remembered that many organisms which exert little or no effect on healthy resistant tissues are, under certain circumstances, able through their products or when introduced together with other organisms to set up irritation of the cutaneous or subcutaneous tissues, especially when introduced in large quantities. We therefore consider that the presence of a large number even of so-called innocuous organisms may, quite apart from their action on the lymph itself, exert a deleterious action on weakened or devitalised tissues. Such lymphs may, when perfectly fresh and in healthy people, be relied upon to do their work properly, but if kept for a time and used for the vaccination of unhealthy persons they may give rise to unpleasant and irritating consequences.

One statement that may be accepted without reserve is that *if the lymph be free from bacteria (especially streptococci and staphylococci) and typical vesicles slow of development with little inflammatory areola and late in coming to maturity be obtained* there need be no fear that the patient is not properly vaccinated.

CONCLUSIONS.

1. During the last three years there has certainly been a marked general improvement in the character of the lymph supplied from various sources.

2. The "extraneous" bacteria have not yet been brought down to a constant quantity and very few of the "brands" that were examined, even allowing for accidental contamination in those cases where only three or four colonies were found, were sterile on all occasions. Certain brands, however, were superior in this respect to others.

3. From a consideration of those brands that were examined and re-examined we are compelled to come to the conclusion that in certain instances the process of glycerination had been imperfectly carried out. It may be that the lymph had not been stored sufficiently long after being glycerinated or, on the other hand, that the mixing had not been sufficiently well carried out or too small a quantity of glycerine had been used.

4. In a few cases, as will be readily gathered from the tables, the collection of the lymph had not been carried out under sufficiently strict conditions of cleanliness and with proper antiseptic precautions, the presence of a comparatively large number of sporulating and anaerobic organisms giving evidence of such laxity.

5. The presence of a large number of organisms on the agar plates affords evidence that sufficient precautions had not been taken to remove the organisms usually found on or in the appendages of the skin and we suggest that special attention should be paid to this point.

6. Where the glycerination is properly carried out there appears to be little danger of the occurrence of active tubercle bacilli in vaccine lymph. We are glad to see, however, that most of those who send out vaccine lymph make a point of having a post-mortem examination made of the carcass of the calf before the lymph is distributed for use.

7. The use of calf lymph entirely does away with any danger of the transmission of syphilis through the agency of vaccine matter. The presence of a small quantity of blood, therefore, is not considered to be of any importance except, as we have pointed out, that it indicates that perhaps more care might have been taken in the collection of the sample. It may, however, be pointed out that it has been proved by recent experiments that the presence of blood, even in small quantities, in vaccine lymph exerts a marked deteriorating influence. The lymph rapidly loses some of its potency, the activity falls more rapidly, and extraneous organisms develop more readily than in lymph so collected that it is not tinged with blood.

8. We are strongly of the opinion that no sample of lymph should be sent out from the makers until it has been under the action of glycerine for a month, except for purposes of export or when supplied to those vaccination officers who understand the action of the glycerine and of the necessity for allowing it time to exert its full power of eliminating all "extraneous" organisms.

9. A bacteriological examination should be made of every batch of lymph that is sent out, and not only the percentage of insertion successes should be given, but the number of organisms, both aerobic and anaerobic, spore-bearing and non-spore-bearing, with the time at which the test was made, should be marked on every tube or set of tubes.

10. We are thoroughly satisfied that, so long as the non-spore-bearing organisms are eliminated and the spore-bearing and anaerobic organisms reduced to a minimum, it is not necessary to send out absolutely sterile lymph. These spore-bearing and anaerobic organisms are—except when the lymph is taken from diseased animals, which should never be the case—entirely innocuous, and it is far better to recognise this fact than to make a pretence of sending out sterile lymph which in many cases has never been "plated for organisms at all.

11. It should be recognised that the less there is left for the glycerine to do the better and more permanent will be the quality and action of the vaccine lymph. With healthy animals, great cleanliness, strict antiseptic precautions in regard to the skin, the hands of the operator, the instruments, and the capillary tubing, the fewer will be, not only the organisms that may be eliminated by glycerine, but also the spore-bearing aerobic and anaerobic organisms.

12. Taking them as a whole the vaccine lymphs, as already stated, are of much greater purity than we expected to find them. Improvements had already been made at the time that the first experiments were systematically carried out, whilst from our later examinations it is evident that still further improvement has been made during the past year.

We shall make periodical examinations until we find that the whole of the vaccine lymphs that remain on the market are equal to the best "brands" now supplied.

We publish these figures with a full sense of the responsibility that we assume in connexion with the future of vaccination. Now that the characters of a good calf lymph are known and that the possibility of obtaining such a lymph free from pathogenic germs and from all but a few spore-bearing organisms has been demonstrated the great objection to vaccination has been done away with. Good calf lymph may be fully utilised and its beneficial effects obtained without any fear of accidental contamination of any kind being introduced—except from the patient or his surroundings—entering into the calculations of the operator.

DESCRIPTION OF ILLUSTRATIONS.

FIG. 1.—Jenner Institute for Calf Lymph. Photograph of gelatin plate made 71 days after it was received which developed 13 colonies.

FIG. 2.—Dr. Chaumier's Animal Vaccine Establishment. Photograph of gelatin plate made 71 days after it was received on which developed 41 colonies.

FIG. 3.—Ferris and Co., Bristol. Photograph of gelatin plate made 123 days after it was received, which developed four colonies.

FIG. 4.—Faulkner's Glycerinated Calf Vaccine Lymph. Photograph a gelatin plate made 71 days after it was received, on which 570 colonie developed.

FIG. 5.—Dr. Warlomont's Glycerinated Calf Vaccine. Photograph of a gelatin plate made 71 days after it was received on which developed eight colonies.

FIG. 6.—Association for the Supply of Pure Vaccine Lymph. Photograph of a gelatin plate made 125 days after it was received on which five colonies developed.

[4] Loc. cit.

NATIONAL ASSOCIATION FOR THE PREVENTION OF CONSUMPTION AND OTHER FORMS OF TUBERCULOSIS.—The Devon and Cornwall branch of this society held its annual meeting at Plymouth on April 19th under the presidency of the Mayor (Mr. J. Pethick). An influential committee was appointed to promote the provision of a sanatorium for the treatment of consumption among the poorer classes in Devon and Cornwall. The chairman stated that he hoped the outcome of the meeting would be the establishment of a sanatorium on Dartmoor. The Earl of Mount-Edgcumbe was re-elected president, Dr. R. H. Clay was appointed chairman, Mr. T. Bulteel honorary treasurer, and Dr. F. G. Bushnell honorary secretary.

THE WAR IN SOUTH AFRICA.

FROM a military point of view there is little or no news to be recorded from the theatre of war. What there is points to the movements of three bodies of our troops bearing down to the relief of Wepener, these being so concerted and arranged as to envelope the Boer forces in that neighbourhood and cut off their retreat to the north. Whether we shall succeed or not in this manœuvre—and success looks very probable—must be shortly known. As regards Lord Roberts's intentions and strategical plans it is needless to say that we can pretend to no more knowledge than "the man in the street," who has during the present war been credited with an amount of information and speculative sagacity (to say nothing of foolishness) to which he has not hitherto aspired. Unless we are much mistaken we may surmise, however, that what was understood to be the original plan of the campaign will be soon undertaken—namely, an invasion of the Transvaal in force at more than one point, the advancing columns converging towards Pretoria as a common centre and objective, and with that end in view every preparation is now being made and completed. Lord Roberts's force at Bloemfontein alone must number 70,000 men at least (probably more), and the provisioning of such a force, together with the requisite supply of the munitions of war, hospital service, and all the *et cæteras*, is a more stupendous undertaking than most people can realise. Everything, it must be remembered, has to be shipped from this country to the Cape and then has to be transported across South Africa to the point where needed.

The relief of Mafeking seems, to everybody's great regret, to have dropped out of the calculations, but only temporarily, we earnestly hope. The British army as a whole is healthy and well supplied and all arms of the service are present in due proportions; the men are in excellent spirits and are looking forward to the work before them. What amount of opposition they will have to encounter must soon become apparent. It looks as if there might be some hard fighting; but, on the other hand, it may turn out that, as in the case of the big American civil war, once the Transvaal has been penetrated it may prove to be "softer" than anticipated and the Boer defence may unexpectedly collapse.

From the latest information from Bloemfontein we learn that there were some 2000 cases of sickness in the field hospitals (not a high percentage), most of them being due to enteric fever and dysentery. The casualty returns show how numerous are the cases and how apparently widespread are these disease-causes. Through the kind coöperation of Sir William MacCormac especially, as well as through other of our correspondents at the theatre of war, the readers of THE LANCET have been supplied with admirable and most instructive information on the surgical aspects of the war and on numerous points of medical, sanitary, and other interest connected therewith. It is some source of gratification to learn that the Mauser rifle, if a very effective military weapon, nevertheless is a relatively merciful one in the character of the wounds which it inflicts. The war has brought home to us and to the world, among other things, the increased intensity and extent of the fire-zone due to the use of the latest and most improved weapons and smokeless powder and the extreme difficulty of scouting except perhaps by balloons, or of ascertaining the way in which entrenchments have been affected by any artillery fire anticipatory to infantry attack. Our experience with the Boers has also shown the great power and strength of a defensive warfare conducted by an enemy knowing every inch of the country and kept well informed by spies in all directions.

THE BELGIAN AMBULANCE FOR THE BOERS.

The efficient treatment of the sick and wounded in war-time is a matter which commends itself to all civilised people without distinction of race, of religion, or of party. The excellence of the Royal Army Medical Corps in the present war in South Africa has deserved and has received unstinted praise. We are sorry to learn that the Belgian ambulance sent out to assist the Boers has been less successful—that is, if we may believe the account given by *Le Matin*, a journal published at Antwerp. According to this paper the management of the Belgian ambulance was by no means ideal and the results obtained have been far from satisfactory. The president of the association, M. Pol de Mont, and the members of the committee are not directly blamed, but it is suggested that there is a doubt as to whether the funds which they were called upon to administer were used to the best advantage. The expedition appears to have started under disadvantageous circumstances and jealousies were aroused on the voyage out. Some members of the corps were treated as second-class passengers, others were relegated to the third class, and on one occasion when the former were treated with champagne the latter were deprived of their accustomed beer because they did not show sufficient respect to the leaders of the expedition. Two members of the corps threatened one another with knives and revolvers; two others fought a formal duel. One medical man constantly quarrelled with a colleague and some of the German members treated three Englishmen who were on board with revolting brutality (*brutalité révoltante*), of which details are not given. Discord quickly reigned even amongst the privileged members of the second class. One lady refused to sit at table with other lady members of the ambulance whose proceedings appeared to her to be reprehensible. The members of the corps who travelled as third-class passengers suffered a great deal of discomfort from being crowded with emigrants who came on board at Lisbon, at Naples, at Port Said, and at Aden, and amongst whom a want of cleanliness was a marked and general characteristic. At Lorenzo Marques some of the German members caused trouble by their imprudence in having introduced into their baggage offensive weapons unfit for the use of peaceful men. The Belgian members of the expedition who started with good outfits were annoyed by the loss of more than half their effects. However, the arrival of the corps at Pretoria in some degree compensated for the discomforts of the voyage. Things began to look better. A banquet was organised, but the gaiety was unfortunately again blighted by the conduct of some of the members. One lady caused offence to the Puritan population by smoking cigarettes at the banquet, at the termination of which there was a general disposition amongst the members of the ambulance to indulge in a free fight. The rest of the story may be briefly told. In the end the corps broke up. The Germans joined the combatants. The ladies dispersed, with the exception of the one who had smoked cigarettes, and she alone remained to carry out her original mission of treating the wounded. On the whole, perhaps, it may be admitted that ambulances are not always managed better on the continent.

CONVALESCENTS RETURNED FROM THE WAR.

The editor of *Guy's Hospital Gazette* sends us a long and interesting communication from Mr. Francis E. Fremantle who is attached as surgeon to No. 1 General Hospital, Wynberg. We abstract the following from the complete paper which will appear in *Guy's Hospital Gazette*:—

"The hospital ship *Avoca* belonging to the British India Steamship Company displaces some 3100 tons. ..... She was transformed into a hospital ship at Durban within a fortnight at a cost of something under £6000 and was designed to carry some 200 cases in cots and bunks—mostly swing cots—and 150 in hammocks. ..... The medical staff consisted of sergeants and orderlies of the R.A.M.C., civilian orderlies and compounders, and of four civilian surgeons, all under the principal medical officer, Major Butterworth, R.A.M.C., who was in charge of the wounded troops on board, as well as of the medical and nursing staffs. The nursing staff consists of six civilian nurses and one nursing superintendent of the Army Nursing Service. ..... The medical officers consisted of the ship's surgeon—Mr. H. Hart Jackson—acting also as civilian surgeon; Mr. J. F. Dell, an old Guy's man and a veteran traveller; Dr. Matthews, a prominent senior Uitlander at Johannesburg; and Mr. Fremantle. They divided the cases about equally between them and took it in turn to be on duty as orderly medical officer for night work, for inspection of the sanitary and culinary arrangements, and for visiting the wards at meal-times to hear and inquire into complaints about the food. In general health, it may be said, the men picked up to a most marked extent on their voyage of 23 days, despite a week's rolling and consequent nausea and discomfort. Such improvement was due to several causes—generous feeding, both in quality and kind, absolute rest, the moral effect of nearing home, and in some cases also the treatment received, both medical and physical. The men, too, in the

first instance are in good health, usually first-rate health, and they are all select men.

"The following table analyses the cases with regard to their main cause of being invalided home:—*Surgical:* Gunshot wounds, 83; shell wounds, 13; contusions, 6; venereal diseases, 39; and other surgical affections, 25. *Medical:* Dysentery, 71; rheumatism, 44; enteric fever, 9; heat stroke, 7; and other medical affections, 40.

"This list probably gives a fair idea of the invalidings at the height of a campaign. At an earlier stage there would be comparatively few medical cases; at a later the proportion of medical cases, especially those of enteric fever, would be considerably increased. The proportion of gunshot- to shell-wounds is interesting as indicating to some extent the comparative value of the Boer artillery and small arms. But this proportion, or rather disproportion, is exaggerated in this list, inasmuch as shell-wounds are usually the most ragged and the most extensive and therefore the most fatal. Fewer cases of shell-wounds survive to be invalided home. It is interesting to note that all but one of the 13 officers invalided home were surgical cases and that the only exception was a case of nervous exhaustion. This is probably due to two causes. Firstly, on account of greater care and general cleanliness, and use of filtered and bottled waters when possible, officers are less liable to infection. Secondly, officers convalescent from moderately severe illness are often useful at the base, if not at the front, whereas private soldiers and non-commissioned officers in the same condition are often unfit even for garrison duty. The above classification refers only to the main cause of the invaliding of each patient. But many patients returned as cases of gunshot-wound developed dysentery in hospital; cases invalided for dysentery had often had some slight wound previously and had returned to duty before being taken ill; several had multiple wounds; some had multiple diseases; and thus it comes about that the writer's note-book includes some 150 wounds and 80 cases of dysentery. The wounds are classified as follows:—A. *Head and neck:* (1) Cranium, 8; (2) face, 3; (3) eye, 5; (4) ear, 1; (5) neck, 4. B. *Chest:* (1) Penetrating, 11; (2) non-penetrating, 3. C. *Abdomen*, 5. D. *Extremities:* (1) Bones, 37; (2) joints, 9; (3) large blood-vessels, 5; (4) large nerves, 11; (5) uncomplicated, 52." The paper concludes with brief descriptions of cases which are both interesting and instructive.

ARRIVAL OF THE MAINE.

The American hospital ship *Maine* arrived at Southampton on April 23rd. Within an hour of her arrival the whole of the sick and wounded were removed in the ambulance train to Netley, where they were admitted to the great base hospital. Arrangements had been made by the executive committee for giving a fitting welcome to the *Maine*, but the plans were frustrated as the committee found on arriving at Southampton that the ship had arrived three hours previously. In expectation of the arrival the quay had been decorated with British and American flags. The *Maine* was flying on her mizzen the Union Jack with the Red Cross presented before her departure by the Duke of Connaught, the Stars and Stripes floated from the foremast and the transport flag from the stern. She brought home 151 men and 12 officers. About 50 of the cases were surgical. Nearly all the patients were convalescent. Lady Randolph Churchill said that the *Maine* had returned because the hospitals since the relief of Ladysmith had become congested and all the hospital ships were full. The progress of the cases was most satisfactory during the voyage. On April 24th Lady Randolph Churchill with some of the committee visited the men from the *Maine* at the Royal Victoria Hospital, Netley, and distributed pipes to them, the convalescent men being on the lawn in front of the hospital.

(NOTES FROM SIR WILLIAM MACCORMAC.)

(*Concluded from p. 1158.*)

In concluding the series of letters upon the medical arrangements of the South African campaign which I have addressed to you I should like to draw attention to the following criticisms and remarks, and considering the extent and nature of the work that I have personally investigated and assisted in I consider these may be regarded as of interest.

During my four months of service with the army as consulting surgeon I have visited Cape Colony on three separate occasions and Natal the same number of times. I have been intimately associated with the officers and men of the Royal Army Medical Corps and their civilian assistants in the base general hospitals, the stationary field hospitals, and the field hospitals in camp, on the march, in the hospital tents, and in the operating tents. I have been with the wounded as they were brought in from the field; have travelled with them during their journeys in the hospital trains down the lines of communication; have been consulted as regards the more serious cases in all these hospitals and also in respect of those on board the hospital ships, all of which I have visited; have inspected and worked in all of the base hospitals; and I now append a list of the medical units with which I have been associated.

General hospitals.—No. 1, at Wynberg, Cape Colony (500 beds); No. 2, at Wynberg, Cape Colony (500 beds); No. 3, at Rondebosch, Cape Colony (500 beds); No. 4, at Mooi river, Natal (500 beds); Maritzburg General Hospital (1200 beds); and the Portland Hospital at Rondebosch (100 beds).

Hospitals on the lines of communication.—Kimberley Civil Hospital (270 beds); Military Hospital at Kimberley (96 beds); Nazareth House College Hospital (96 beds); No. 4 Stationary Field Hospital at Chieveley (500 beds); Estcourt Hospital (School House Convent, 100 beds); Agricultural Hall Hospital at East London (200 beds); No. 3 Stationary Field Hospital at Frere (200 beds); and Intombi Hospital, Ladysmith (1900 beds).

Field hospitals (100 stretchers each, on the move).—Two at Naauwpoort (Jan. 20th); one at Rensberg (Jan. 22nd); four at Chieveley at the battle of Colenso (Dec. 15th, 1899); one at Chieveley (Feb. 11th); and the Cape Volunteer Field Hospital at Orange River (Feb. 17th).

Hospital trains.—Two in Natal (frequently) and one in Cape Colony.

Hospital ships.—The s.s. *Nubia*, 479 beds; the s.s. *Lismore Castle*, 242 beds; the s.s. *Trojan*, 160 beds; the s.s. *Orcana*, 320 beds; the s.s. *Spartan*, 130 beds; the s.s. *Princess of Wales*, 184 beds; the s.s. *Maine*, 136 beds; and the s.s. *Avoca*, 378 beds.

Besides the above there are the Medical Reserve Depot and train at Durban and the German Hospital at Jacobsdal (90 beds).

All the units above enumerated have been described and criticised in detail in my letters, and a few general remarks upon the workers in them may not now be out of place.

ROYAL ARMY MEDICAL CORPS.

The professional surgical effectiveness shown by the officers of the Royal Army Medical Corps during my intimate connexion with them whilst they have struggled with difficulties of location, transit, want of water, and a hundred and one other impediments never experienced in a civil hospital in peace, is, in my opinion, of a very satisfactory character, and everything has been done which one could possibly suggest under the varying circumstances for the comfort and skilful treatment of the wounded.

The rapidity and completeness with which large field hospitals were conveyed by road or rail, unpacked, and re-erected, reflect great credit upon the organising powers of the officers and the effective carrying out of their orders by the hard-working and patient non-commissioned officers and men of the corps under them. My letters will have sufficiently illustrated these facts, but attention may be particularly drawn to the letter in THE LANCET of Jan. 20th, p. 184, descriptive of the Battle of Colenso.

JUNIOR CIVILIAN SURGEONS.

The young surgeons at present employed with the army have been of great professional assistance on account of the inadequacy in point of numbers of the officers of the Royal Army Medical Corps. They have been attached to the various stationary hospitals and several have been sent to the front to replace wounded or sick officers of the Royal Army Medical Corps. Many of these surgeons who have held responsible junior hospital appointments have shown that surgical skill which might be expected of them. Others have not shown the same standard of excellence in their work, their experiences in general practice obviously not having qualified them so well for military surgery.

It must be remembered that these gentlemen are employed for very little beyond actual professional work and that, therefore, the total responsibility and onus of the administrative work, which is by no means a minor duty, devolves upon the officers of the Royal Army Medical Corps, in addition to

their professional duties which they perform in a like degree to the attached civilians. The misunderstandings arising from the want of disciplinary training of the civilian surgeons and the training required to familiarise them with the workings of the army and the men of the Royal Army Medical Corps who assist them have naturally increased the responsibility thrown upon the officers of the Royal Army Medical Corps commanding the various hospitals.

CONSULTING SURGEONS.

The value of consulting surgeons can be best shown and in the most effective manner by their work at the large stationary hospitals. During the heat of action and the necessarily hasty nature of the surgical work in the field the opportunities for the employment of special surgical acquirements are less apparent, and the presence of the consulting surgeon, although of much help, is, I submit, of smaller value than in a large base hospital where serious complicated and difficult cases are numerous.

NURSING SISTERS.

The work of the army nursing sisters has been admirable and endless. As soon as one batch of serious cases from the front was comfortably settled and a partial rest seemed possible another batch arrived. The untiring energy and patience shown by these ladies under great difficulties and stress have been beyond praise. The sisters of the Army Nursing Reserve and very many civilian trained nurses have, of course, been also employed and the same remarks in perhaps a somewhat less degree apply to them also. The members of the Army Nursing Reserve have been trained to a certain extent in army work but the civilian nurses proper have to be looked after in official matters by the sisters of the Army Nursing Service. The work has also undoubtedly been hampered in some cases by the interference of ladies who know little of hospitals or nurses and who wish with the best intentions to help, but their inexperience renders them ineffective for good.

CRITICS.

It is astonishing that many of the criticisms of the hospitals, some appearing in influential papers, should receive the attention that has been given to them, considering the want of knowledge and inexperience plainly shown by the critics whose letters prove by internal evidence in many instances that they are unworthy of any serious attention.

GUNSHOT WOUNDS.

It would be alike interesting and instructive if information could be obtained as to the precise character of the injury in the fatal cases of gunshot wounds. This is obtainable in regard to patients who die in hospital some time after the receipt of the injury, but in the case of those—and they are the great majority—who die on the field itself, the record will be of necessity scanty or altogether wanting. After most actions the efforts of the authorities are exhausted in effecting the burial of the dead, and this is sometimes only accomplished with much difficulty. I fear that it is a vain thing to expect the medical officers to obtain information of value as to the nature of the wounds producing mortal consequences.

One must on the whole, as the cases which I have quoted amply illustrate, be much impressed with the large proportion of harmless, or comparatively harmless, wounds which the Mauser bullet inflicts. The head, chest, and abdomen may be, and are, traversed without inflicting mortal injury, and in a considerable proportion of cases without inflicting permanent injury of any kind whatsoever. The rapid healing of the external wound is remarkable. It rapidly closes under a black scab. This characteristic of the external wound in the cases of those injured by the Mauser bullet did not differ in any material degree in the wounds inflicted by the Lee-Metford bullet on the wounded Boers whom I saw at Jacobsdal. Yet a good many of these wounds were suppurating, and as the difference between the two bullets is so slight the difference in results must, I believe, be ascribed to a large extent to the fact that our wounded have been treated so speedily after the receipt of their injuries with the first field dressing on the field. In one of my previous letters[1] I commented upon the careful and effective manner in which the wounded on their arrival at the first field hospitals were found to have been dressed. The British soldier has been well drilled by the officers of the Royal Army Medical Corps upon the method of application of the first field dressing which each man carries on his person, and judging by the way in which these dressings were applied by the men themselves or by comrades in the absence of the medical officer their teaching appears to have been by no means ineffective and the good results are very appreciable.

Severe visceral damage seems capable of being recovered from in a way which never ensued after wounds produced by the heavier bullets employed in previous wars. In this campaign, as in former ones, the comparatively insignificant damage produced by the most formidable artillery is once more apparent, although, I believe, very much was expected from the recent great developments in this arm. It is, after all, the rifle fire, not artillery, which kills and damages men. The Mauser bullet frequently perforates a bone—even the compact tissue of the shaft—without causing complete fracture in a larger proportion than has ever previously been observed.

Nerve injury and damage to blood-vessels have occurred in large numbers. A peculiar feature of the nerve wounds is that in many cases the bullet has perforated the nerve without complete severance, leaving strands of tissue on each side intact, as I have seen even in nerves as small as the musculo-spiral and median. In many cases of arterial wound the limited amount of extravasation of blood has been very remarkable and vessels of very large size have often been wounded without any immediately fatal issue.

Wounds of the neck.—I have seen many cases in which bullets have traversed the neck from side to side in almost every direction without any serious consequence supervening, the remarkable fact being that the important structures appear to have so often entirely escaped damage, although apparently directly in the line traversed by the projectile.

Wounds of the chest.—In this region one finds case after case convalescent after a bullet has traversed the lung, and in many instances both lungs. The heart and pericardium have so often been found to lie in the track of the bullet that it seems probable that these highly vulnerable structures must in several instances have been actually pierced. In a few cases both the abdomen and the thorax have been traversed by the same projectile without serious inconvenience to the patient.

Wounds of the abdomen.—In many instances the men were without food or drink for many hours before being wounded. In these cases the wounds of the bowel, like those in the skin, must often, one must suppose, seal up and close before any extravasation of fæcal matter can occur. In some, but surely only in a few cases, the projectile may traverse the abdominal cavity without any visceral perforation; but such cases are, I believe, rare and this suggestion does not suffice to explain the large number of recoveries which follow traversing wounds of the abdomen, for in the great majority of these the viscera must have been damaged. The liver, kidneys, stomach, and bladder have also been wounded without a fatal issue.

I have seen some cases of successful laparotomy and many more I know of have been unsuccessful; the injury has been irreparable in many. In many too long an interval had elapsed and there were other unavoidable hindrances. Be this as it may, I feel sure that the mere fact of a Mauser or Lee-Metford rifle bullet traversing the abdomen is of itself no sufficient indication of the necessity for abdominal exploration or operation. I have seen so many cases of this kind in which the patients have recovered without any surgical interference that one may well pause before deciding to expose a wounded man to the inevitable risks attending such an exploration.

In the field hospitals where these operations might be performed under favourable conditions because of the brief interval which has intervened since the receipt of the injury the attendant circumstances are otherwise very unfavourable. In the first place a large number of wounds have to be dealt with, affording but little time for detailed examinations and still less for lengthy operations. In many places the fearful dust-storms and the plagne of flies render aseptic conditions impossible of attainment. On the other hand, if men who have received abdominal wounds are transferred to a hospital along the lines of communication where a larger staff or more complete equipment and ampler time permit these operations to be done in all respects as one would wish to do them the success is for the most part barred by the length of interval which has occurred. I do not myself believe that what one may call primary abdominal surgery can have the successful prospect before it which we would all

[1] THE LANCET, Jan. 20th, p. 184.

wish it to have, nor can secondary operations have any brighter outlook. In arriving at a decision in any case we must therefore not ignore the fact that there are many abdominal wounds which recover without any surgical interference and from what I have observed the evidence of serious internal hæmorrhage or the advent of symptoms of peritonitis would appear to be the two chief indications for operation. We must also remember that these operations must frequently be performed amidst surroundings very ill calculated to afford a fair chance of success.

Gunshot wounds of bone.—These wounds have already been referred to but I wish to add a few remarks with reference to fractures of the femur. Gunshot wounds of the femur do best in proportion to the shortness of transport. Many patients have been of necessity carried long distances and I expect when the statistics of the war are completed that a considerable proportion of these will be found to have done badly. The ideal treatment for gunshot fracture of the femur, as a medical officer expressed it to me, would be to erect a tent over the wounded man where he fell and not transport him at all. I recollect the veteran Stromeyer, then consulting surgeon to the third German army corps, expressing quite similar opinions to me at a place called Floing, near Sedan, during the war of 1870-71. The Hodgen extension splint appears to have afforded excellent results at Wynberg and is perhaps the least irksome form of apparatus to the sufferer.

In respect of the "stopping power" of the Mauser and Lee-Metford bullet there is no doubt that a man may receive a flesh wound in any part of his body and be thereby none the worse for many hours. He can carry on for a certain time even after receiving a chest wound or a gunshot fracture of the upper extremity, but with these and one or two other exceptions his fighting capacity after being wounded is practically *nil*. In a war like this there is no such thing as a "rush" of a body of men on either side.

WILLIAM MACCORMAC.

WITH THE IMPERIAL YEOMANRY HOSPITAL.

(FROM A SPECIAL CORRESPONDENT.)

THE VOYAGE OUT.

The staff of medical officers and orderlies went out in two divisions. Lieutenant-Colonel A. T. Sloggett, R.A.M.C., and Mr. A. D. Fripp with all the orderlies, set out on Saturday, Feb. 10th, in the *Norman*, whilst Dr. Washbourn and Mr. Raymond Johnson with the other medical officers and dressers started on Monday, Feb. 12th, in the *Majestic* from Southampton. On Saturday, Feb. 17th, Miss Fisher with 39 nursing sisters and 10 wardmaids followed in the *Guelph*.

ON THE "MAJESTIC."

About 200 people collected on the quay to bid farewell to the *Majestic*, and as the anchor was being weighed loud cheers were raised again and again by those left on shore and echoed by those on board, and to the strains of "Auld Lang Syne," played by the military band on board, the voyage of the *Majestic* to South Africa was begun. The greatest enthusiasm was shown and tearful partings were almost conspicuous by their absence. The 3rd Welsh Militia (under Colonel Perkins) and the 3rd King's Own Lancasters (under Colonel North), with 250 reinforcements for the Guards, were also on board the ship, which was carrying, with her own crew, 1801 men all told. Every morning and afternoon physical and military drill was held on the officers' deck for the men and their physique and general condition greatly improved during the voyage. Target practice from the stern of the vessel with rifles for the men and revolvers for the officers took place daily, and was much needed, as some of them were raw recruits. The food for officers and men was of the best and everybody's comfort was diligently cared for by Captain Smith, R.N.R. The only untoward event during the passage was the unfortunate death of one of the privates of the Lancasters from pneumonia. He was buried at sea on Feb. 25th. As the *Cheshire* lost four and the *Armenian* nine men from the same cause the *Majestic* is to be congratulated on having had only one fatality. On all three of our vessels epidemics of sore-throat occurred and several cases of influenza also cropped up, but with few exceptions the attack was a slight one.

Many of the medical officers, as well as military officers and men of the different regiments on board, were inoculated against typhoid fever. In almost all cases the inoculation caused headache, general malaise, with aches and pains, and in many cases on the *Majestic* a rigor more or less severe occurred within a few hours of inoculation. The temperature often rose to 104° F. and pallor and faintness were marked for a day or two, and the patients preferred as a rule to stay in bed. The pulse was weak but not much increased in frequency. In a very few cases very slight constitutional symptoms occurred and, apart from the pain at the seat of inoculation, practically no discomfort was suffered. The patients themselves said that the inoculation brought about a condition closely resembling an attack of influenza. In any case the serum, one cubic centimetre of which was inoculated, seemed to act as a strong cardiac depressant. The iliac region was generally chosen as the seat of inoculation, where invariably redness, œdema, and inflammation occurred with very acute pain. The glands in the groin became enlarged, inflamed, and painful, and rendered walking difficult and painful for several days after all constitutional symptoms had disappeared. In all cases good recoveries were made. It is claimed by Professor Wright, the inventor of the serum, that its protective powers last for two years. The results so far obtained point to the fact that the odds are two to one against inoculated persons taking typhoid fever, and the same against death supervening if an attack of typhoid fever should be contracted as compared with the non-inoculated.

As we passed through the tropics the heat became very great and all the most favourable positions for spending the night on deck and on the more comfortable cushioned seats of the companion hatches were secured early in the evening by those who found the air of their cabins too oppressive to sleep in. Owing to the south-east trade wind blowing steadily against us as a head wind it was a most favourable time for crossing the line, as this breeze did much to lessen the effects of the tropical rays of the sun. On deck one scarcely experienced any discomfort from the heat. But matters were very different for those who had to attend to the fires of the engines, and several cases of heat-stroke occurred amongst the stokers; one very severe case occurred with three relapses and a fatal issue was avoided only by the most careful attention of the medical officer. In bad cases the temperature rises to 107° F. and even higher, faintness quickly comes on, the patient becomes unconscious and even comatose, and in the worst cases there is an entire absence of perspiration. Dr. Mackenzie, the ship's medical officer, said that patients invariably recovered if there was free perspiration. The treatment consists of cold affusion or rubbing with ice until the temperature falls and the administration of stimulants, generally by hypodermic injection, as the patient is unable to swallow. As recovery takes place the temperature becomes normal, consciousness is regained, and perspiration takes place, but relapses may occur without any fresh exposure to excessive heat. About 30 stokers on board the *Majestic* suffered from heat-stroke and some of the privates of the Welsh Regiment volunteered to act in their place.

Whilst in the Bay of Biscay a stiff breeze began to blow on the Tuesday morning and it freshened by the evening to a full gale, necessitating the closing of the hatches, and the few passengers who were not suffering from *mal de mer* were ordered to keep below. Owing to the fact that we were shipping some very heavy seas on to the deck on which the horses were stabled the engines were worked at low pressure. However, by midday on the Wednesday the wind had fallen and most of the passengers were able to appear at lunch. This storm was, no doubt, connected with the blizzard which passed over London a few days after the departure of the *Majestic*. Subsequently calm weather was experienced all the way to Table Bay. The *Guelph*, however, had a very rough passage, the roughest which has been experienced for five or six years.

ST. VINCENT.

On Sunday, Feb. 18th, St. Vincent was reached. Immediately the anchor was cast in the bay the vessel was surrounded by a flotilla of small boats containing native fruit-sellers and native divers. The boys comprising the latter class were most expert divers and swimmers; they dived into the sea after pennies which were thrown in for them and invariably caught them before they had sunk far. For a shilling one of them dived right under the vessel, although she was drawing 26 feet of water at the time, and came up on the other side. The oranges and bananas grown on the island are very luscious and are offered at the rate of eight for 1*d*. The island itself is volcanic in origin and very

barren, and only small portions of it are under cultivation. Its only importance is as a coaling and telegraph station. There is no trade and the English population only numbers about 100; the Portuguese, to whom the island belongs, are in slightly larger numbers. The natives closely resemble the negroes of the West African coast, but many of them have a strong admixture of Portuguese blood in their veins. Besides their own native tongue they speak Portuguese and broken English. It was interesting to see that a new hospital was being built upon the most approved modern principles for the treatment of medical and surgical cases.

The Portuguese prison is well worthy of a visit and is looked upon as one of the sights of the town, just as Bethlem used to be in London. The prisoners rush to their doors and windows and thrusting their heads and hands through their prison doors solicit alms from the visitors to pay their fines or to supplement their dietary of two meals of maize and beans a day. A more curious sight than half a dozen heads thrust through the opening of the gridiron-like doors of the prison cannot be imagined. Many prisoners share the same room; one Englishman had been imprisoned by the English consul for deserting from the cargo ship *Eric* and had to share his quarters with several natives. Most of the native prisoners, both men and women, were imprisoned for fighting, some of them serving terms of from 15 to 18 months.

As soon as we reached St. Vincent one of the officers of H.M.S. *Cumbrian* came alongside in a steam pinnace and communicated to us the good news of the relief of Kimberley by General French with 6000 cavalry, of the retreat of General Cronje with his army towards Bloemfontein, and of their pursuit by General Kelly Kenny and General French and others. Two French cruisers were also in the bay, but both left whilst we were coaling, one of them going to quell an insurrection which had occurred in Martinique, one of the islands of the West Indies.

Whilst in the tropics it was interesting to watch the shoals of flying-fish rising near the bows of the vessel and flying close to the surface of the water, sometimes as far as 40 or 60 yards. Their size varied from that of a sprat to that of a good-sized herring. Although they as a rule keep close to the surface of the water, one of them flew on to the deck of the ship. The phosphorescence of the sea could generally be seen at night, but it was more brilliant in Table Bay than during any part of the voyage. It is a curious fact that any disturbance of the surface of the water greatly increases its brilliance and duration, such as pouring water into the sea from a height, or even throwing any object into the water will immediately produce an area of phosphorescence where before none was visible. Darwin, in his "Voyage Round the World," speaks of this phosphorescence as "the respiration of the sea," and explains it as due to the decomposition of tiny organic particles held in suspension in the water. He made an experiment which he thought proved that it was not due to the agency of any living organism by drawing up some phosphorescent water in a canvas bucket and allowing it to dry for hours. When quite dry the phosphorescence was still present and hence he concluded that it was due to some chemical change and could not be due to living organisms which would all have been killed by such prolonged drying. But a similar phosphorescence can be observed in England in the summer-time on bones and on the fibrous tissues of meat which has been kept for some time in an ice safe. It is well known to English butchers and is no doubt due to commencing decomposition caused by the action of bacteria.

CAPE TOWN.

On March 1st at 10 A.M. the *Majestic* cast her anchor in Table Bay and the news of the surrender and capture of Cronje with some 4000 prisoners was learnt at once. At about 11 A.M. on the same morning guns were fired and rockets sent up and most of the ships in the harbour began to dress themselves with bunting, and soon the cause of all this demonstration was heard to be the receipt of the news of the relief of Ladysmith. All Cape Town went mad that night. Free drinks and free cigars were offered to all men wearing Her Majesty's uniform. The town was illuminated and a patriotic concert was held in aid of funds for the relief of the wounded.

The recollection of Cape Town itself is not a pleasant one; it is summed up in two words—heat and dust. The streets are wide and many of the public buildings are very fine. Electric trams run to the various suburbs, one of the most charming of which is Wynberg, the Sydenham of Cape Town. The houses are of all heights and sizes and give a very irregular appearance to the different streets. Owing to the large influx of refugees prices in Cape Town are high; it is possible to buy articles out here at Deelfontein for about half the amount charged for them in Cape Town. Whilst in Cape Town we lived on board the *Majestic*, as did all the soldiers also. One medical officer who tried to get sleeping accommodation at one of the hotels was asked £2 to be allowed the privilege of sleeping on a sofa. Before our departure some of our number had the satisfaction of witnessing the arrival of Cronje with his wife and family as prisoners. They arrived at 7 A.M. on Friday, March 2nd, and as they passed through the streets of the town they were hooted and hissed by the crowds collected to greet them. During our stay in Cape Town we were made honorary members of the Senior Civil Service Club by the kind offices of Mr. Fripp.

THE JOURNEY FROM CAPE TOWN.

Our stay in Cape Town was a short one. On March 3rd the whole of the medical staff and the orderlies entrained at a siding in the goods station and started at 4 P.M. for Deelfontein which Lord Roberts had chosen as the site of the hospital. First-class sleeping compartments in a corridor train were provided for the medical officers, four of whom occupied each compartment. Two of the bunks were cleverly arranged to shut up out of the way during the daytime when not in use. A present of biscuits was sent to the orderlies from the Mayor of Cape Town and given to them just before the train started. Soon after leaving the goods train our carriages were attached to a long train containing our old acquaintances of the *Majestic*, the 3rd Welsh Militia, who were ordered up to De Aar.

For the first 300 miles or so our path crossed the Great Karoo or desert, a wide expanse of sandy, desert-like country, with sparsely scattered shrubs and bushes of a stunted growth. A large number of watercourses, sometimes 30 feet across, could be distinctly traced, although their beds were quite dry. As we proceeded we were gradually mounting to an elevation of 5000 feet above the sea-level, and this caused considerable strain upon the engines, which was, however, lessened by the line being built upon a modified switchback plan. The line has to make many curves and detours to escape different kopjes, with which the whole country seems to be thickly covered. For hours we could see Table Mountain in the distance and ahead of us the Hex river mountains of whitish stone formed a conspicuous and picturesque landmark. On Sunday (March 4th) we were overtaken by a heavy thunderstorm which was travelling almost exactly in our direction and which kept up with us for hours, finally either exhausting itself or passing on ahead of us. Owing to the hot climate the wood of the carriages contracts and this makes them not quite watertight. In some compartments the rain entered very freely, and it was an amusing sight to see different members of our staff sitting in their compartments under their umbrellas. The storm was a heavy one and resembled a very heavy thunderstorm in England with the difference that it lasted for hours. The rain came down with such force that a heavy mist of spray rose from the ground and was blown along by the wind. Fortunately before night the storm had passed and we were able to dry our carriages and to rest in comfort.

En route we stopped at Wellington for dinner, and at 6 A.M. at Majestfontein for breakfast, and also at Prince Albert-road and Beaufort West for other meals. The meals were rather hurried, but considering the difficulties of providing for such a large number one could not complain. Hottentots generally acted as waiters; they are usually the domestic servants out here.

Every station and bridge along the railway was protected by an encampment of Imperial forces, many of them being Cape Volunteers. The line is patrolled and a sentry is on duty at every station as the line passes through many disaffected districts. There is a force of rebels at Beaufort West at the time of writing. Our train was heartily cheered as it passed the different camps.

We were much interested to see several trainloads of Boer prisoners from Cronje's commando. As the trains generally stopped opposite one another conversation from window to window was easily possible. Most of the Boers were very well satisfied to be taken prisoners, but one of them, when interrogated, replied that it remained to be

seen yet whether being a prisoner was better than being shot, and remarked that he was not at all pleased to be out of the fighting. One passenger told them that we were going to Pretoria, to which the wily Boer replied, "Well, take care of yourself, for you will have a warm reception." All kinds of carriages and cattle-trucks were used for conveying the prisoners, who were receiving the same food as Tommy Atkins. They were generally a hardy-looking set of men, with splendid teeth, weather-beaten faces, and long beards.

At Fraserberg Road a trainload of refugees from Kimberley passed us on their way to Cape Town for a rest and holiday after all the trials of the siege. One lady told us that they were reduced to eating the flesh of horses, donkeys, and mules, mule-flesh closely resembling veal and being most popular. For those who could not eat horse-flesh, siege soup of unknown composition but containing no horse-flesh was served out. When the Boers began shelling the women's quarters all the women and children were shut down in a mine for a week just before General French relieved them. They did not look very ill considering the hardships which they had undergone, but many children had sickened and died during the siege.

DEELFONTEIN.

At about 8 A.M. on Monday, March 5th, we arrived at Deelfontein, which is situated 29 miles south of De Aar and 471½ miles from Cape Town. There is no town here, the only buildings being the station house, a general store kept by a Jew who sells everything, and a pumping station which is capable of raising 18,000 gallons from the well, which gives an exceptionally pure supply of water and consequently makes Deelfontein an important place where all the trains obtain a supply of water as they pass through. The place is on the direct route from Kimberley and Bloemfontein to Cape Town. Besides these buildings there is a military camp 50 strong of the D.E.O.V.R. force and our own hospital encampment, which is pitched at the foot of a line of kopjes which serve as a protection from the wind.

On our arrival at Deelfontein Sergeant Vassey was found to be missing and a telegram was received to say that his body had been picked up on the line. He had unfortunately fallen from the train and had been instantly killed.

One hut and a few tortoise and bell tents were erected as soon as we arrived and a small three-roomed brick cottage was commandeered as the commandant's headquarters. We were hungry and a picnic breakfast of hot sausages and bread was quickly prepared by our cook. We were obliged to eat with our thumbs and fingers as no forks and knives were unpacked. Now something like a dozen huts are erected and 150 patients are under treatment and another batch of 100 patients is expected. Despite the difficulties of transport of goods from Cape Town in ten days we were in a position to receive 200 patients.

The hospital is divided into three divisions under the leadership respectively of Mr. A. D. Fripp, Mr. Raymond Johnson, and Dr. Washbourn. Each qualified medical officer has from 30 to 40 beds allotted to him and treats his patients subject to the supervision of his chief. In my next letter I hope to give a more detailed account of the various divisions and special departments of the hospital with particulars of the patients and their wounds.

WITH BRABANT'S FORCE.

The following interesting letter has been sent to us by Dr. Robert Lee, who received it from a friend with Brabant's force:—

Aliwal North, Orange River, March 24th, 1900.

"I came home at the end of the year just in time to get word of the three reverses—Gatacre's, Methuen's, and Buller's. I had previously offered my services but they were declined. However, I turned straight round and came out and was fortunate in being appointed upon General Brabant's staff and started with him from Queenstown and thence on here. We have had some stiff fighting and I have had my hands full with wounded, only two amputations—one through the middle of the thigh and one through the middle of the upper arm, very simple. The Mauser flesh wounds heal in a most wonderful way, and it is quite rarely one gets suppuration. But we get some bad Martini-Henry wounds and also some from expanding bullets, and these last shatter dreadfully. The Mauser bullet will sometimes (it depends upon the distance it has travelled) traverse the cancellous ends of the bones without splintering or causing much constitutional disturbance. The segment shell the Boers use causes much shattering if the segment hits a bone and ugly torn flesh wounds. I swear by iodoform gauze and a double cyanide outer absorbent, either gauze, wool, or preferably both, according to the amount of effusion. In many cases huge quantities of blood are effused into a limb or under the skin of the trunk but this all gets absorbed. One drawback is that we cannot get a good and ample diet for our wounded and granulations are apt to get flabby. Preserved vegetables grow to be awfully tiresome after a bit. Meat we have in abundance, milk only in spasmodic fashion. It is raining great guns here and we are only waiting for the roads to be passable for our wagons in order to move forward.

This column (Brabant's) has been very fortunate, for our men fight Mr. Boer after his own method, which is, after all, astoundingly simple and consists in availing oneself of all possible cover. Then as we are a mounted force we can move quickly. Infantry is comparatively useless here; good for storming purposes granted, but then in a country such as this is, consisting of one long series of natural fortresses, the Boers abandon one position only to take up another just behind; and so the loss falls awfully heavily upon the foot soldiers, the Boers all being mounted and fighting as mounted infantry. Their horses are trained to stand and almost never stampede. We have to thank our artillery for driving the brutes out, for so effectually are they always covered that nothing but shell can get at them; they particularly dislike shrapnel. It is quite rarely that our men get a fair slant at them out in the open.

The rebel Boers have been surrendering here and at Dordrecht in great numbers, and a contemptible, unwashed, mean-looking crowd they are; as one looks at them, knowing full well that but a few days ago they were picking off our men, one grieves that our over-lenient Government has not seen fit to string, at any rate, the ringleaders up on the traitor's tree.

Our people were just in time to save the bridge (Frere Bridge, after Sir Bartle Frere) which spans the Orange river here. The river is now partly swollen by the rains and rolls down a good tawny body of water. Had the bridge not been saved we should have had to go round by Bethulie. I fancy our column will march up the eastern side of the Free State, as already a sufficient body of troops is concentrated at Bloemfontein. I fancy the Boers will make their next big stand at Kroonstad as many roads converge there, and I hear the country suits their style of fighting. Sir Alfred Milner has just come down from Bloemfontein, but *unconditional surrender* and nothing short of it must be exacted from the Boers or we shall have them bobbing up again.

All being well Kruger will live to see a united dominion of South Africa, but under English sway, not under Dutch, as he had fondly hoped. His dream, ridiculous as it seemed to English people when war was declared, was not so vain as we thought; the war has proved that. The conceit and arrogance of the Transvaal Dutchman and his brother in the Free State, Cape Colony, and Natal were only adequately known by those who had lived among them, seen it, and suffered from it. To hate the English was a quick passport to any office in the Transvaal, and so it came about that the place has become a wasp's nest of French, Germans, Hollanders, &c., riff-raff of continental Europe, bound only by this one thing (if one excepts lust of gain)—viz., hatred of our nation.

What a home-coming it will be when all is over. All our troops have done awfully well and Britain need not fear that her sons are falling off in stamina. I have seen all sorts of heroic things done, often by mere striplings. Then the wounded are, almost to a man, very plucky, and I have never worked among people less disposed to grumble. They know we do the best possible for them according to means available and they are grateful.

This is a great time for the niggers, they loot all over the place, and no amount of punishment will stop them. Most of them have old long-standing grudges against the Boers."

LITERARY INTELLIGENCE. — Messrs. John Wright and Co. of Bristol will in a few weeks publish a treatise on Operative and Practical Surgery by Mr. Thomas Carwardine, assistant surgeon, Bristol Royal Infirmary. It will consist of about 700 pages and the text will be supplemented by over 500 original drawings by the author and numerous woodcuts. It will be of an essentially practical character and is intended as a guide to clinical work.

THE ETHICS OF DIRECT REPRESENTATION.

DR. TOOGOOD forwards to us the following correspondence with a request for publication:—

I.

Lewisham Infirmary, April 16th, 1900.

DEAR MR. HORSLEY,—In reply to your letter to me of 11th instant the general meeting at the Charing-cross Hotel on 12th instant, which took the name of "The Joint Committee to oppose Midwives Registration," hoped that the enclosed draft address of constituents to M.P.'s for their boroughs or divisions would satisfactorily define our position (in accordance with your election addresses and expressions) as not opposing the registration of midwifery nurses but maintaining the principles of the Medical Acts, and resisting the creation of an inferior order of practitioners of midwifery, and that we should have your support both at the proposed conference at the House of Commons and also in an extraordinary general meeting to be at once convened with the same objects by requisition of members British Medical Association. Our highest ground for this resistance, which we are sure is not what you would wish to characterise as childish, is the danger to the lying-in woman you so well illustrated at the West Ham meeting by the instance of death from post-partum hæmorrhage before medical attendance can be procured. With this explanation I am to convey the following "recommendation" in the report of the executive adopted by the meeting: "That Direct Representatives be invited to be honorary presidents of the committee" to act on public occasions as may be arranged to their mutual convenience; and to express the earnest hope of the meeting that in this crucial position we shall have the advantage of your influential support.

I am, dear Sir, yours very faithfully,

F. S. TOOGOOD.

25, Cavendish-square, W., April 19th, 1900.

DEAR TOOGOOD,—After I have waded through the Andersonian effusion which you have sent me and after I have given it the fullest consideration I find that your committee propose to deal with the midwives registration question in the following manner: In the first place they have abandoned the barren negative policy of no legislation to which Mr. George Brown and others up till a month ago were pledged, and in the second place they propose now to deal with the question by reviving the old matter of midwifery nurses which was brought forward several years ago by others besides myself in the British Medical Association as a solution of the problem, which was very fairly and fully considered by the association and was finally rejected on vote. The same solution of the question was also handled by the General Medical Council I think in a very fair way, and also rejected. The promoters of the present Bill before the House in the Grand Committee on Law, which has just passed the Bill through, have had the point before them, and have emphasised their intention of having nothing to do with the midwifery nurse aspect of it by specifically altering the definition of the term "midwife." I really honestly think that to again take up as a method of dealing with the subject that which the British Medical Association and the General Medical Council and now the House of Commons have all said they will have nothing to do with deserves the appellation "childish." For a number of years I have spent a great deal of time on this subject endeavouring to free the various proposed schemes of legislation from objectionable points which would injure the profession and I shall continue to do what I can on behalf of the profession, but I must decline with all respect to spend any time on methods which have already been dealt with and finally put aside.

Yours sincerely,

VICTOR HORSLEY.

The Infirmary, Lewisham, S.E., April 25th, 1900.

DEAR MR. HORSLEY,—I have written on behalf of the S.E. London meeting and my joint committee. You compel me by your remark to infer that an "Andersonian effusion" means unanswerable arguments you prefer to avoid; at least, you do not attempt to deal with mine but mis-state my communication and answer your own mis-statement, which now appears an epidemic method of avoiding difficulties.

Only two and a half, scarcely "several," years ago, during your candidature for the General Medical Council, you fully and formally approved of the policy of registering midwifery or obstetric nurses provided that such nurses were not to render any medical attendance in any case. We do not advocate or promote such a measure, but do not reject it as a compromise; and we cannot correctly be said to "revive" it because, as a compromise, we never relinquished it. That you should cite (the Council of) the British Medical Association (for the association in general meeting has, I believe, never abandoned registration of midwifery nurses as an acceptable compromise) or the General Medical Council as authorities for giving up *any* policy or contention is indeed both "new and strange," and is explicable only on the supposition that you are much in need of countenance in a predetermination. Acceptance of defeat in Parliament, incurred when we were prepared for no effective resistance, and when that defeat is far from final, would be an abject turning of the cheek to the smiter we should least of all have expected you to advise.

What is a "barren negative"? Is it a direct and determined negative to the repeal of the Medical Acts and systematic creation of inferior orders or practitioners? Do you mean by that equivocal stigma that such a direct negative is "barren" because it cannot succeed? If so the reply is obvious that this cannot be known until it is tried and that it has not yet been tried. If tried by constitutional means it cannot fail with your powerful help; possibly not without it if withheld. Our policy, a policy to which when a candidate you fully assented, is not merely "negative." We *affirm* the Medical Acts and propose to enforce and amend the law and so to *abate illicit midwifery*. If, however, you mean that any policy is a "barren negative" which does not recognise and regulate the illicit practice of midwives as a measure of public safety I reply that we object to no measure or name so long as persons not medically educated are not to be recognised as competent and entitled to perform medical functions which would *not* be for the public safety but the reverse.

Have you any objection to state explicitly (1) whether or not you consider diagnosis of presentation a medical function; (2) whether you consider it consistent with public safety to entrust that function to persons not medically educated; (3) what remedy, if any, has been found for public dangers such as you indicated at West Ham, instancing that post-partum hæmorrhage "might kill a woman before a midwife could send for a medical practitioner." I hope you will have no objection to give equally plain answers to these plain questions and to satisfy grave misgivings as to whether you are for us or against us upon the principles they involve; and that we may receive your coöperation, which we believe we are entitled to expect, in the further very vigorous and practical measures we are taking to render the maintenance of the Medical Acts very much the reverse of a "barren negative."

I am, dear Mr. Horsley, yours very truly,

F. S. TOOGOOD.

II.

The Infirmary, Lewisham, S.E., 24th April, 1900.

DEAR DR. GLOVER,—My letters were not personal. I could only make such communications on behalf of the S.E. London Meeting and Joint Committee. I fear I shall not lessen my offence by admitting that I was certainly wrong in the paragraph you object to; for that you clearly prove you do *not* "know the mind of your constituency" and demonstrate that you do "occupy your seat on the General Medical Council for the purpose of representing" *not* "the views of your constituents" but "your own." Your constituents may perhaps entertain some doubt whether either these hard facts, or the frankness with which you avouch them, afford you or them, or representation itself, added dignity or value. They leave you, in fact and theory, our dictator, or, as you are to *think* for us, our Pope; us your abject dependents, deprived of the right of private judgment or the right to act upon it in our own affairs; and "representation" a contradiction in terms; since, if your views or ours should change after we elect you, it is your views, and not ours, that are to have effect. Pardon my saying that whilst avoiding the points raised you misrepresent my meaning in order to seem to have something to meet which you can appear to defeat.

I have not said or implied that for you "to hear should be to obey" or that you are to receive the orders of any "clique" of the profession. It is your complacency (I refrain from calling it your subserviency) to "gentlemen

representing ..... too indirectly the profession and the medical authorities" which we deplore. *They*, in fact, represent "cliques" some of which, to establish bogus diplomas, would register midwives "educated" or not, would create an inferior order of practitioners of midwifery, and would thus repeal the Medical Acts. From the seductions and influence of representatives of such cliques we would rescue you for the legitimate service of your constituency.

Our case rests upon the facts we have invited you to verify, by seeking re-election, viz.: (1) that "the group of men, well known and defined," indeed, who "are at my back," is practically your constituency; (2) that the views I have put forward of the principles of Direct Representation are the views of that great constituency and afford in its opinion the only conditions which render representation worth preserving or extending, or the election of a "representative" anything but a solemn farce, covering all who take part in it with well-merited contempt. For it would be contemptible to take any part in electing a "representative" who on pretext of whatever grave deliberation, with the overpowering influence of "medical authorities" and "the State," is to be entitled to modify all his previous opinions and to represent "not the views of his constituents but his own." Of such "representation" our profession has indeed more than enough.

Your quotation from "a great man in a larger electoral sphere" might serve you less well if considered with the context and occasion. Did he relieve his feelings by resigning? If he knew the "mandate" to be that of practically his whole constituency he grievously offended against the accepted usages and the "ethics of representation" if he persisted in retaining his seat and misrepresenting his electors—misusing their "trust" to oppose and defeat their purposes.

The test we have suggested you will not accept. You assume that the electors who voted for you in 1896 are still of the same mind and assert that your views and action are those on which they have returned you. I dispute both assumption and assertion. The votes which returned you in 1896 were the remnant of previous polls nearly double in number, diminished chiefly by conversion on this very question; and partly by dissatisfaction with your observed complacency or openness of mind to the grave arguments of the "representatives of medical authorities and the State" on questions in which the interests of those gentlemen were opposed to the interests of your constituents and profession. Was not this dissatisfaction and the conviction that Direct Representatives are helpless in their small minority unless united the reason why Sir W. Foster and Mr. Wheelhouse refused to come forward with you for re-election? The remnant of votes which returned you may be divided into three classes: (*a*) constituents unhappily only too gravely interested in securing the registration of midwives; (*b*) your undoubtedly numerous personal friends; and (*c*) a large section of old supporters who preferred to continue that support rather than desert you on a question as to which their opinions were not very definite or their convictions very strong.

If you accepted our invitation you would find it justified by the fact that of this last section the views of a large number have since become both definite and strong in opposition to the views you then expressed, and that another large section considers that you are not now acting in accordance with the views you then expressed, so that you would find yourself supported only by constituents interested in securing registration of midwives and by personal friends and adherents, probably not, in all, one-tenth of your electorate. I go further. I not only say that your action is not now consistent with your election promises since you now know they are impracticable, but that it has never been, nor your expressions consistent in themselves. I take your own quotation of them in the letter I am answering and I affirm that in those very expressions you juggle with words to deceive or delude your followers until, perhaps, like a certain "great man in a larger sphere," you end, or possibly begin, by deluding yourself. For what is it but to juggle with words to say: "I am fully alive to the importance of maintaining the principle ..... that midwifery is one of three branches of the art of medicine and that those who are not qualified in the other *two* can only act subordinately to members of the medical profession"? These words seem a promise to preserve the principle, whilst they, in fact, in the very act of utterance, betray and abandon its essence. They imply that those who are not qualified in medicine and surgery can be qualified in midwifery; they condition that such singly qualified persons are to practise subordinately, but they conceal mental reservations that they are to be held "qualified" to judge when medical assistance is required, and that the subordination is to be so impracticable as in fact to be a dead letter.

Behind this confusion of ideas you veil the transfer of medical functions to persons without medical education—for instance, the diagnosis of presentation at present recognised by law only in medical practitioners and the transfer of which by law to others is in fact a repeal and reversal of the principle of the Medical Acts which you promised to maintain.

I am, yours very truly,
F. S. TOOGOOD.

We have received the following for publication from Dr. F. S. Toogood:—

At a meeting of the Executive it was proposed by Mr. Parke and seconded by Dr. Henry:—

That this executive of the joint committee to oppose registration of midwives fully endorses Dr. Toogood's letters to Dr. Glover and Mr. V. Horsley, but deeply regrets that such letters should have been called for and appeals to Dr. Glover and Mr. Horsley in their position as Direct Representatives to overlook all other considerations and to afford their valued help to this organised resistance to the registration of midwives and creation of inferior orders of practitioners.

To the Editors of THE LANCET.

SIRS,—On your own maxim, at the head of your Correspondence column, "*Audi alteram partem*," I respectfully claim that as you published Dr. Glover's attack on me and others for the resolution at the Cannon-street Hotel suggesting that he should test the views of his electors by resigning and seeking re-election you should also give insertion to my defence of myself from that attack, justifying the course I took by exposure of Dr. Glover's errors and false position, explaining the spontaneity of my conduct as not being one of the organisers of the meeting, and giving other grounds not covered by Dr. Lorimer Hart's letter which you inserted. Viewed together with the depreciatory tendency of your report of the meeting, especially the grave misleading statement that it was attended by "a small number of medical men," and your presumable predisposition to support your own reports, your implied denial of Dr. Hart's statement of the number remaining when he moved his resolution (not 17, as your report states, but 30), and your exclusion of my letter containing direct and specific personal support of Dr. Hart's statement, point to inferences which could be accepted only with pain and regret. These indications are not weakened when it is remembered that what is in question is Dr. Glover's conduct as a Direct Representative; that he is one of the oldest members of your staff; and that it must be difficult for you to avoid some bias in his favour and tendency to wish his conduct to appear in the best light. I am sure I express the feeling of the great body of the profession in appealing to you, instead of supporting him in his mistaken course of undoing the work of your founder, the Medical Act of 1858, to use your great influence, especially by encouraging public discussion in your columns, and by your powerful advocacy of the rights of the profession for the public safety guaranteed in that Act, to induce him to coöperate in combined action of the public and the profession to maintain that Act in its fullest extent. May I request the favour of insertion of my previous letter with or without this?

I am, Sirs, yours faithfully,
Bath-road, Chiswick, April 24th, 1900. JOSEPH SMITH.

*** Mr. Smith's previous letter was too long to be inserted last week. In view of the above correspondence sent to us by Dr. Toogood this week and seeing that Mr. Smith's letter has already been published by a contemporary we do not think it necessary to do more than print the above letter.—ED. L.

To the Editors of THE LANCET.

SIRS,—Dr. Glover is to be congratulated on the firm and dignified position he adopted in his reply to Dr. Toogood and "The Emergency Committee of Public Safety against Midwives' Registration." Whatever may be the views we hold on this and other questions, it cannot be too emphatically understood that our Direct Representatives on the

General Medical Council are not delegates. No really good man would consent to accept such a position if he is to be considered a delegate. In this particular Bill there is plenty of room for difference of opinion as to the details. It seems that legislation for the protection of parturient women of the poorer classes is inevitable; instead of attempting to wreck the Bill, supported as it is by many eminent authorities, it is better policy to concentrate all our efforts in inducing Parliament to insist on clauses which will keep these women as far as possible under the intimate supervision of the medical profession. The position of Direct Representatives at this juncture is a difficult one; Dr. Glover is an old and tried representative of the profession; his past actions and published opinions surely justify us in trusting him to do what is best under the circumstances. He knows the opinions of all parties and from his practical knowledge of medical politics is in a position to judge the best course to adopt to protect the interests of all concerned.

I am, Sirs, yours faithfully,

Margate, April 23rd, 1900. BERTRAM THORNTON.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN 33 of the largest English towns 6523 births and 4747 deaths were registered during the week ending April 21st. The annual rate of mortality in these towns, which had been 23·0 and 22·4 per 1000 in the two preceding weeks, further declined to 21·3 last week. In London the rate was 20·6 per 1000, while it averaged 21·6 in the 32 provincial towns. The lowest death-rates in these towns were 12·9 in Birkenhead, 13·0 in Burnley, 13·8 in Swansea, and 15·5 in Brighton; the highest rates were 26·9 in Liverpool, 27·2 in Oldham, 28·8 in Manchester, and 30·6 in Plymouth. The 4747 deaths in these towns included 432 which were referred to the principal zymotic diseases, against 500 and 477 in the two preceding weeks; of these 159 resulted from measles, 123 from whooping-cough, 56 from diphtheria, 32 from diarrhœa, 30 from scarlet fever, 29 from "fever" (principally enteric), and three from small-pox. The lowest death-rates from these diseases occurred last week in Croydon, Portsmouth, Halifax, and Newcastle; and the highest rates in Cardiff, Oldham, Plymouth, and Blackburn. The greatest proportional mortality from measles occurred in Plymouth, Bristol, Cardiff, and Wolverhampton; from scarlet fever in Oldham; from whooping-cough in Wolverhampton, Birmingham, Liverpool, and Manchester; and from diarrhœa in Oldham, Blackburn, and Gateshead. The mortality from "fever" showed no marked excess in any of the large towns. The 56 deaths from diphtheria included 17 in London, eight in Sheffield, four in Cardiff, four in Leicester, and four in Leeds. Three fatal cases of small-pox were registered last week in Liverpool, but not one in any other of the 33 towns. There were four cases of small-pox under treatment in the Metropolitan Asylums Hospitals on Saturday last, April 21st, against two and four at the end of the two preceding weeks; and two new cases were admitted during the week. The number of scarlet fever patients in these hospitals and in the London Fever Hospital at the end of the week was 1676, against 1713 and 1694 on the two preceding Saturdays; 165 new cases were admitted during the week, against 172, 185, and 189 in the three preceding weeks. Influenza was certified as the primary cause of 60 deaths in London. The deaths referred to diseases of the respiratory organs in London, which had increased from 378 to 501 in the six preceding weeks, declined again last week to 460, but were 92 above the corrected average. The causes of 59, or 1·2 per cent., of the deaths in the 33 towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in Leicester, Salford, Bradford, Leeds, Hull, Newcastle, and in 13 other smaller towns; the largest proportions of uncertified deaths were registered in West Ham, Birmingham, Nottingham, Liverpool, and Sheffield.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in the eight Scotch towns, which had been 22·8, 21·7, and 21·3 per 1000 in the three preceding weeks, further declined to 21·0 during the week ending April 21st, and was 0·3 per 1000 less than the mean rate during the same period in the 33 large English towns. The rates in the eight Scotch towns ranged from 18·4 in Edinburgh and 18·6 in Paisley to 22·6 in Aberdeen and 25·3 in Perth. The 650 deaths in these towns included 19 which were referred to whooping-cough, 18 to measles, 14 to diarrhœa, six to scarlet fever, five to "fever," and three to diphtheria. In all 65 deaths resulted from these principal zymotic diseases, against 63 and 66 in the two preceding weeks. These 65 deaths were equal to an annual rate of 2·1 per 1000, which was 0·2 per 1000 above the mean rate last week from the same diseases in the 33 large English towns. The deaths from whooping-cough, which had been 15 and 17 in the two preceding weeks, further rose last week to 19, of which 10 occurred in Glasgow, four in Leith, two in Aberdeen, and two in Perth. The fatal cases of measles, which had been 14 and 19 in the two preceding weeks, declined again to 18 last week, and included 11 in Glasgow, three in Edinburgh, and two in Dundee. The deaths from diarrhœa, which had been 19 in each of the two preceding weeks, declined last week to 14, of which four were registered in Glasgow, three in Edinburgh, two in Dundee, and two in Greenock. The fatal cases of scarlet fever, which had been four in each of the four preceding weeks, rose to six last week, and included five in Glasgow. The deaths referred to different forms of "fever," which had been five and four in the two preceding weeks, rose again last week to five, of which three were recorded in Glasgow and two in Aberdeen. The three fatal cases of diphtheria corresponded with the number in the preceding week, and included two in Glasgow. The deaths referred to diseases of the respiratory organs in these towns, which had declined from 172 to 134 in the three preceding weeks, rose again to 145 last week, and were 26 in excess of the number in the corresponding period of last year. The causes of 25, or nearly 4 per cent., of deaths in these eight towns last week were not certified.

HEALTH OF DUBLIN.

The death-rate in Dublin, which had been 28·9 and 34·3 per 1000 in the two preceding weeks, declined again to 30·4 during the week ending April 21st. During the past four weeks the death-rate in the city has averaged 32·5 per 1000, the rates during the same period being 21·0 in London and 21·7 in Edinburgh. The 204 deaths registered in Dublin during the week showed a decline of 26 from the number in the preceding week, and included 12 which were referred to the principal zymotic diseases, against nine and six in the two preceding weeks; of these, three resulted from "fever," three from diarrhœa, two from measles, two from diphtheria, and two from whooping-cough. These 12 deaths were equal to an annual rate of 1·8 per 1000, the zymotic death-rate during the same period being 1·6 in London and 1·0 in Edinburgh. The deaths referred to different forms of "fever," which had been three and two in the two preceding weeks, rose again to three last week. The three fatal cases of diarrhœa showed an increase upon the number in the preceding week. The deaths from measles, which had been three and two in the two preceding weeks, were again two last week. The fatal cases of whooping-cough, which had been three and one in the two preceding weeks, rose again last week to two. The 204 deaths in Dublin last week included 42 of infants under one year of age and 63 of persons aged upwards of 60 years; the deaths of infants showed an increase, while those of elderly persons corresponded with the number in the preceding week. Six inquest cases and three deaths from violence were registered, and 69, or more than a third, of the deaths occurred in public institutions. The causes of 10, or nearly 5 per cent., of the deaths in the city last week were not certified.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments are announced:—Surgeons: G. R. MacMahon to the *Sphinx* and James G. Watt to the *Esk*, additional.

ROYAL ARMY MEDICAL CORPS.

Major M. W. Kerin, Lieutenant Martin, and Lieutenant Sloan have left South Africa for England.

YEOMANRY CAVALRY.

Worcestershire (The Queen's Own Worcestershire Hussars): Julius Henry Beilby to be Surgeon-Lieutenant.

VOLUNTEER CORPS.

Artillery: 1st Lincolnshire (Western Division, Royal Garrison Artillery): Surgeon-Lieutenant L. W. Pockett to be Surgeon-Captain. 2nd West Riding of Yorkshire (Western Division, Royal Garrison Artillery): Surgeon-Lieutenant J. C. Wright to be Surgeon-Captain. 4th West Riding of Yorkshire (Western Division, Royal Garrison Artillery): Percival Ellison Barber to be Surgeon-Lieutenant. *Royal Engineers* (Volunteers): 2nd Cheshire (Railway): Edward Gray to be Surgeon-Lieutenant. 1st Hampshire: Surgeon-Lieutenant R. Emmett to be Surgeon-Captain. *Rifle:* 1st Volunteer Battalion the Lincolnshire Regiment: John Bruce to be Surgeon-Lieutenant. 2nd Volunteer Battalion the Prince Albert's (Somersetshire Light Infantry): Second Lieutenant Penrose Lanyon Watkin-Williams resigns his commission and is appointed Surgeon-Lieutenant. 1st Volunteer Battalion the Duke of Cambridge's Own (Middlesex Regiment): George Pester Chappel to be Surgeon-Lieutenant. 15th Middlesex; Henry Bowen Perkins to be Surgeon-Lieutenant.

VOLUNTEER MEDICAL STAFF CORPS.

The Manchester Companies: Joseph Collier to be Surgeon-Lieutenant.

TRANSVAAL WAR NOTES.

The first train carrying wounded and invalids from South Africa steamed down the new cutting and into the station in the rear of the Royal Victoria Hospital, Netley, on Monday, April 23rd, at 11.30. The train carried 149 patients brought home by the *Gascon;* 17 of the men were obliged to be carried into the hospital, but the majority of the men looked perfectly well and fit to return to duty. The "khaki train" is fitted up with every necessity and luxury. There are five carriages, each fitted with 12 beds and two sofas, besides accommodation for the medical officers and places set aside for cooking and lavatories. The carriages run with great smoothness, hardly any motion being perceptible. In addition to the "khaki" carriages ordinary railway-carriages are attached to the train for carrying convalescents. Many of the patients are from the forces which relieved Ladysmith.

A *Times* telegram, dated Cape Town, April 25th, says: "Dr. Robert O'Callaghan, who is attached to the Langman Hospital, which has been established at Bloemfontein, and is secretary to the Portland Hospital, is leaving for England to-day. As it has been found that the majority of the patients to be treated were suffering from enteric, it is considered that a second surgeon is not required at the hospital, and it has been decided to appoint Dr. Scholtz, a leading Cape Town physician, in succession to Dr. O'Callaghan."

Mr. Herbert J. Godwin, M.B., B.S. Durh., M.R.C.S, Eng., L.R.C.P. Lond., has been appointed Civil Surgeon to Her Majesty's troops in South Africa.

Surgeon James G. Fowler, R.N., was among the officers of the Ladysmith Naval Brigade who were entertained at Portsmouth on April 24th.

TRANSVAAL WAR CASUALTIES.

It is officially reported that Assistant Surgeon Jackson, 21st Battery, F.A., died from typhus fever and dysentery at Pretoria.

REWARDS FOR GALLANTRY IN THE R.A.M.C.

The Queen has conferred the decoration of the Victoria Cross on Major William Babtie, C.M.G., R.A.M.C., for his conspicuous bravery at the battle of Colenso. The following is the act of courage for which he receives the honour:—"At Colenso, on Dec. 15th, 1899, the wounded of the 14th and 66th Batteries, Royal Field Artillery, were lying in an advanced donga close in the rear of the guns without any medical officer to attend to them, and when a message was sent back asking for assistance, Major W. Babtie, R.A.M.C., rode up under heavy rifle fire, his pony being hit three times. When he arrived at the donga, where the wounded were lying in sheltered corners, he attended to them all, going from place to place exposed to the heavy rifle fire which greeted anyone who showed himself. Later on in the day Major Babtie went out with Captain Congreve to bring in Lieutenant Roberts, who was lying wounded on the veldt. This also was under a heavy fire."

DEATHS IN THE SERVICES.

Henry Stewart Archdall, M.R.C.S. Eng., L.R.C.P. Lond., late surgeon R.N., on April 20th, aged 32 years. He entered the Royal Navy in 1892 and retired in 1896.

We hear that the surgeons-on-probation for the Royal Army Medical Corps now attending the Army Medical School, Netley, are likely to receive their commissions at once and be sent to do duty with the troops. These gentlemen have attended a course of two months' duration at Netley. We also understand that a second batch of nominated officers for the Royal Army Medical Corps is to be sent to the Army Medical School on May 1st to go through a short course of instruction.

The *Broad Arrow* states that "some 24 civilian medical officers are now doing duty at or about the Cambridge Hospital at Aldershot, some of them having been employed for many months, and although they are willing enough to do duty temporarily, yet there appears to be no wish on their part to become attached to the service permanently."

Correspondence.

"Audi alteram partem."

THE SOCIAL FACTOR IN THE GENESIS OF CANCER.

To the Editors of THE LANCET.

SIRS,—Will you allow me the hospitality of your columns to draw attention to a peculiar incident in the international variation of the cancer rate? I allude to the concomitant prevalence of late marriages in countries with high cancer rates as compared with those which are more or less cancer free. It will be familiar to those who have practised in the East that cancer is practically unknown among the Brahmins and almost so among the Hindoos and Mahomedans. The Parsees and the descendants of European settlers are not quite so fortunate. Nor is cancer so uncommon among the Baba Chinese and the Chinese, Javanese, and Japanese coolies in the tropical colonies. There are not two races more dissimilar in the matter of personal hygiene, so divergent in their daily pursuits, and, in fact, in all that constitutes the *summum bonum* of life, than the Brahmin and the negro.

A strict vegetarian and total abstainer, engaged in purely intellectual pursuits or ruminating over his "mantrums" and "slokas," the Brahmin has lived the life of a student for 2000 years, in a civilisation contemporaneous with Solomon. "Astram Castrum," still almost a savage in his native wilds, a carnivorous, perhaps an "uncooking animal," dependent upon the chase for his subsistence, and where in contact with the civilised world a slave under forced labour, the muscular negro is the perfect antithesis of the subtle Brahmin, pre-eminently the latter's superior in powers of physical endurance as he is undoubtedly far below the Brahmin in all that constitutes subtlety of intellect and high brain power. Search the world over and you will not find two races so diametrically opposite as the Brahmin and the negro. What one lacks the other excels in. Still we find they both enjoy an almost perfect immunity from cancer, while European nations possessing the virtues of both suffer severely. Their common humanity excepted, perhaps the only line in agreement between the negro and the Brahmin is that neither very seldom begins to accept the duties of the procreation of the species when past the meridian of life and their women never. The same rule holds good more or less with most Asiatics, and we see they do not suffer much from cancer as a race. The nations that suffer most are those in the front ranks—the Saxon, the Gaul, and the American. And is it not notorious that it is just among these great nations that more old spinsters enter into matrimony when approaching, or are past, the menopause than is the case with the Greek, the Turk, the Iberian, the Finn, and the Norwegian? And is it not a fact, too, that cancer is on the increase in Europe, and so also have been these late marriages during the last few generations? Is it a mere coincidence or is there the relation of cause and effect between these two concurrent waves?

Can it be the fact that when the consummation of puberty is early attained, is accomplished in good time, that it finds

the breast and the womb more fitted for the activity attendant upon the marital and the maternal state than when after long hibernation, so to say, after years of disuse, and when these organs have almost forgotten the habit and to a certain extent have lost the instinct nature had endowed them with primarily? And that in the latter case the extra-vascular supply, the increased cellular activity attendant upon the connubial or the pregnant state, is more liable to accidents, is more apt to run into vicious channels, to be diverted from its natural course into the formation of neoplasms? Or does cancer take its origin in the repression of the sexual feeling during the antecedent long celibacy? And in either case might it be that the progeny of these late prudential marriages inherit the tendency from their birth? Cancer, for instance, is more frequent at the terminations and bends than at other parts of the alimentary canal. Might it not be due to muscular irritability? There is more muscular tissue at these parts. Cancer of the rectum is ascribed to the irritability of detained fæces. The repressed sexual desire will also engender some irritation. Is there anything in this *a posteriori* argument?

Oil-bathing is a regular institution among the Hindoos. An experienced masseur rubs the oil on his patrons, friends, or relations generally once a week. And it is a fact that moles, warts, and such faults of the surface of the skin are very rare among them. The new-born infant gets the oil bath daily for 40 days. The intervals are then gradually lengthened, but he will be considered a very naughty boy who during his school days tries to shirk the oil bath at least once a week. As a youngster he yells all the time he is being bathed. Perhaps it is good for his lungs. Anyhow, nobody thinks of finding fault with the nurse for the hollaing of her charge and, generally speaking, it may be said that Indians have better lungs and better pectorals as compared to the body-weight than the Europeans, and the feminine bust is decidedly fuller and more perfect. Perhaps that is also one cause of the rarity of cancer of the breast among them.

I am, Sirs, yours faithfully,

April 23rd, 1900. C. N. SALDANHA.

UNION HOSPITAL, MIDDLESBROUGH.

To the Editors of THE LANCET.

SIRS,—As the Middlesbrough Board of Guardians are advertising for a workhouse medical officer will you allow me, out of a dearly-bought experience, to warn intending candidates to ascertain exactly what will be expected of them by this board, and to compare the extent of work and responsibility with the entirely inadequate remuneration and "residence" (some quarters in the hospital which is at the back of a steam laundry), provided.

I may mention that I am resigning voluntarily on account of the treatment received from the board, details of which are scarcely of sufficient interest for your columns; but if any intending candidate cares to write to me I will give him particulars. Within a little over two years three workhouse medical officers have resigned here.

I am, Sirs, yours faithfully,

L. G. DAVIES, M.D. Cantab,
Medical Officer, Workhouse and Hospital;
Visiting Medical Officer, Broomlands Children's Hospital.

Middlesbrough, April 23rd, 1900.

NOTES FROM INDIA.

(FROM OUR SPECIAL CORRESPONDENT.)

The Ravages of Plague in Calcutta and Bombay City.—The Water-supply of Bombay City.—Malaria and the Sources of Water supply.—Figures of the Famine.—The Formation of an Anglo-Indian Army Hospital Corps by Eurasians: Speech of the Viceroy.

A DEATH-RATE of 117·5 per 1000 per annum has been reached in Calcutta for the week ending March 24th. The five years' average is 51 per 1000 per annum. The increase is wholly due to plague—deaths from which amounted to 878—as no other epidemic diseases are prevalent, and deaths from cholera and small-pox are actually below the average in number. The case mortality is apparently very high. The existence of plague is no longer doubted by the natives who are leaving the city by thousands every day. It seems astonishing, but there are still a few people (including one or two with a medical training) who endeavour to persuade the public that it is not real plague which is causing the doubled mortality but some other fever. Their appeal now is, fortunately, to a very limited section. The mortality from plague is increasing nearly all over India. For the week ending March 24th there were 4834 deaths, as against 4725 in the previous week. In Bengal there were 2186 deaths, Patna district alone contributing 1986. In Calcutta the plague mortality rose from 744 to 878. In Karachi the lull has been only temporary and the disease is now increasing again with great rapidity. A further development must be anticipated. The great mortality which has ruled in Bombay during the past eight weeks shows signs of abating. The rate is, however, still over 130 per 1000 per annum. The total deaths last week amounted to 2364, against an average of between 500 and 600. The absurdity of the registration is shown in giving 244 deaths from phthisis—a rate of 15 per 1000 per annum; in giving 377 deaths from respiratory diseases and 250 deaths from remittent fever—whatever this may be. The probable number of deaths from plague is 1500, but the official returns say 780.

I am glad to see that inoculation still goes on in Bombay and that 4821 operations were performed last week, making a total since Sept. 6th, 1899, of 133,305. It is unsatisfactory to hear, however, that the prophylactic fluid distributed is still being sent out in corked bottles and of varying degrees in strength. Some of the brews apparently are only half as potent as others. It is reported that 20,000 doses are being sent to the Australian colonies.

Complaint has recently been made of the contamination with vegetable matter both in solution and suspension of the water supplied to Bombay city. There is no evidence of contamination with animal organic matter. It will be remembered that the city derives its water-supply from three large lakes several miles inland. These lakes are filled by the rain water flowing over the forest and other lands around. It is said that the district is intensely malarious. This therefore becomes a matter of importance. The supply from the Tausa lake is unfiltered and only 50 per cent. of the Tulsi supply is filtered. It is reported that the filtered Tulsi water contains an excess of albuminoid ammonia, but that it is otherwise good. Besides the careful attention to the conservancy of the gathering grounds it behoves the medical advisers of the municipality to investigate the reported malarious character of the district.

It has been suggested that persons inhabiting certain districts in and near towns receiving unfiltered water-supplies are more subject to enlarged spleens and other reputed manifestations of malaria than the inhabitants of other districts apparently similar but having a filtered water-supply. If further observations prove that this statement has some foundation the presence of malaria in the gathering grounds of a water-supply is a danger to the community. With regard to Bombay city it may be stated boldly that compared with many places malaria is infrequent; the average death-rate of the city proves its comparative absence. In the districts around Calcutta, on the other hand, malaria is common, whereas in the city itself I am told it is comparatively rare. The death-rate of the suburbs is, as a rule, higher than that of the city, and the greater part of the city receives water from the river Hoogly after filtration. The suburbs get what they can. The distribution of malaria by mosquitoes has not yet been fathomed, and therefore this point is one which might be further inquired into. One may easily theorise that the organism of malaria can infect through the supply of water as well as by the bite of an insect. Under any circumstances the water to a large city should be adequately filtered.

The Government authorities in India are engaged in relieving nearly 5,000,000 persons. Such a thing has never before been heard of in the history of an Indian or any other famine. In the Central Provinces twice as many people are in receipt of relief as at the height of the disastrous famine of 1897. In one district alone—that of Raipur—over 30 per cent. of the whole population are receiving relief—i.e., 500,000 persons out of a total of 1,600,000 are being supported by the State. Again, in four districts of Bombay between 20 and 30 per cent., and in three districts of Berar 20 per cent., are receiving relief. It is re-assuring to find, however, that

there has been a decrease of 350,000 during the past week. The totals now under relief are 3,346,442 in British provinces and 1,330,080 in Native States.

After receiving a deputation of members of the Anglo-Indian Association the Viceroy made an important speech on the Eurasian question. The spokesman of the deputation complained that Eurasians were practically shut out from the army, although they formed the greater part of the Volunteers in India. In this connexion he asked for the formation of an Anglo-Indian army hospital corps which might take the place of the present native army hospital corps. Amongst other subjects he also referred to their exclusion from the higher offices and from certain railway and other appointments. The military medical services chiefly concern readers of THE LANCET, however, and Dr. J. R. Wallace of Calcutta said that the British Army in India had its minor medical needs attended to by a staff of warrant medical officers who were all Anglo-Indians educated in the medical colleges of the country. They mustered about 1000 and their improved professional education and course of medical study rendered them a very efficient and reliable class of medical officers. They performed the bulk of the routine medical work of all the British station hospitals in India and accompanied their regiments wherever they went. Some had gone to South Africa and others had taken sole medical charge of British transports. He suggested that Anglo-Indian medical officers might relieve members of the Indian Medical Service of many unimportant civil duties. He then spoke of the abolition of the Native Army Hospital Corps, which does the nursing and other detail duties of the British station hospitals, and said that this corps was useless as a nursing machine attached to the army. He urged that this corps should be replaced by Anglo-Indians specially trained as compounders, nursing orderlies, cooks, and dressers, with terms of service and salary on the same lines as the British soldier. In the course of a well-prepared, outspoken address the Viceroy referred to these specific claims. He pointed out that Eurasians were frequently accepted as recruits in the Indian army and showed, however, that while the Eurasian corps was of great service in the Mutiny it was not subsequently considered to be a success and was disbanded between 1860 and 1870. The question of the corps formation had been considered since and the opinion held was that it would be equally expensive and less efficient than a corresponding European force. The same difficulties applied to the formation of a Eurasian Army Hospital Corps. Eurasians could never serve for the rates of pay that were now given to the native equivalent, nor could the subordinate duties such as those of bhistis, bearers, and sweepers be carried out by a Eurasian corps. The long and short of it was that for the present, at any rate, the objections to Eurasian enlistment in the regular army were held at home to outweigh the advantages. The Viceroy, however, said that if the deputation were to submit their proposals as to an army hospital corps in a definite and intelligible shape he would be prepared to place them before the military authorities. They would have to convince the authorities that a Eurasian regiment, which would cost quite as much as, if not more than, a British regiment, would be at least as efficient for military purposes. Other subjects were referred to by his Excellency and the address generally was considered to be a very fine discussion on this important question.

March 29th.

BIRMINGHAM.

(FROM OUR OWN CORRESPONDENT.)

The Women's Hospital.

THE annual meeting of the governors of this hospital was held on April 4th. The report showed that the number of new cases treated at the out-patient department during the year was 3457, being an increase of 168 as compared with last year, the total number treated during the year being 17,469. 404 patients were admitted to the in-patient department, being an increase of 30. The total number of operations was 384, an increase of 17. The number of operations involving abdominal section was 170, and five of the patients had died, or 2·94 per cent. This death-rate compares with 11·67 per cent. on 699 cases treated during the years 1872–84 inclusive and 5·33 on 2090 cases for the years 1885–98 inclusive, that is a death-rate up to Dec. 31st, 1898, of 6·99 per cent. on 2789 cases. The committee regret the loss by death of Mr. Lawson Tait, to whose ability a fitting tribute was paid as one of the pioneers of the institution, and of Mr. J. D. Goodman, one of its staunchest supporters, a vice-president for 28 years and a trustee from the beginning. It was decided to increase the salaries of the nurses. Various votes of thanks were passed, and the hospital was stated to be in a good financial position.

Lying-in Charity.

The work done by this charity is of an unobtrusive but valuable kind, being conducted mainly by four midwives residing in four districts, who call in the aid of the medical officers when required. Some attention has been given recently to the desire on the part of the medical staff and of some supporters of the charity to constitute an in-patient department. It is considered that the work done might be utilised for the training of nurses and midwives and for the clinical instruction of students of the school of medicine, under appropriate supervision. The report read at the annual meeting on April 10th—being the fifty-seventh year—stated that 914 cases had been attended during the year, with only one death of a mother. 891 children were born alive, 37 were stillborn, and 10 deaths occurred. The expenditure showed a slight excess over the income. An interesting presentation to the secretary, Mr. J. C. Gell, followed the meeting. The Lord Mayor, Alderman Beale, in handing an illuminated address and a cheque to Mr. Gell, expressed the pleasure it afforded him to recognise the services, extending over 42 years, of so able and valuable an officer.

Food and Drugs Act.

It is interesting and often curious to witness the evasions and the attempts made to escape the letter of the law in the administration of this Act. An instance lately occurred at a neighbouring police-court, where a man was summoned for selling butter adulterated with 77·98 per cent. of foreign fat. According to the evidence the man refused to sell half a pound to the daughter of the police-sergeant and subsequently to the police-sergeant himself, saying that his stock was all ordered. On being reminded that a heavy penalty might be the result of this refusal he afterwards caused half a pound to be left with the sergeant by a boy. The defendant refused at first to accept any money for it, but on the officer insisting 5*d.* was charged. The defence set up was that there was no sale within the meaning of the Act, that is, that there should be an actual sale and not a forced sale. Notwithstanding this ingenious effort the magistrates stated that they were satisfied and imposed a fine of £5, refusing also to state a case. At a recent meeting of the town council a prosecuting solicitor was appointed as assistant to the deputy town clerk, evidently with the intention of dealing with the large number of cases which come within this Act.

April 24th.

LIVERPOOL.

(FROM OUR OWN CORRESPONDENT.)

Royal Infirmary Appointments.

THE following appointments to the different departments of the Royal Infirmary have been made by the committee:—House physicians: R. T. Bailey, M.R.C.S. Eng., L.R.C.P. Lond.; W. S. Henderson, M.B., Ch.B. Vict.; A. Hope Simpson, M.R.C.S. Eng., L.R.C.P. Lond. House surgeons: A. S. Arkle, M.R.C.S. Eng., L.R.C.P. Lond.; W. H. Broad, M.B., Ch.B. Vict.; H. M. Fletcher, M.B., B.Ch. Vict. Ashton-street department: J. T. Grierson, M.B., Ch.B. Vict.

The New Food and Drugs Act: the First Prosecution in Liverpool.

The first prosecution under the new Food and Drugs Act took place at the police-court on April 11th. A local trader was summoned for selling baking-powder (which under the new Act was made an article of food) which contained 33 per cent. of alum. As some doubt existed in the mind of the stipendiary magistrate as to the culpability of the defendant, who pleaded that he had sold the baking-powder under the impression that it was the genuine article, the prosecution was withdrawn on payment of the costs of the case.

The Colne Jubilee Cottage Hospital.

The Colne Jubilee Cottage Hospital, the gift of Mr. W. P. Hartley of Aintree, was formally inaugurated on April 21st by the Earl of Derby. The hospital has been presented to the town of Colne by Mr. Hartley in commemoration of the Queen's Diamond Jubilee. A plot of freehold land upon which the hospital is built was also included in Mr. Hartley's gift. The inhabitants of Colne have raised amongst themselves sufficient funds to provide an endowment for the institution for 20 years. Colne now possesses a modern and well-equipped cottage hospital. Hitherto all cases of accident or illness have had to be conveyed to the Burnley Hospital, a distance of six miles. The building is arranged as a central block of two storeys, with two wings of one storey, and has accommodation for 14 patients. Externally the building, which has a pleasant and commanding position, presents features of the Tudor style of architecture, the walls being faced with Yorkshire parpoints, with Winewall stone dressings, and half-timbered work in the gables. The total value of Mr. W. P. Hartley's gift, inclusive of land, buildings, and furnishing, is about £5000. Lord Derby in formally opening the proceedings alluded to the well-known liberality of Mr. Hartley in the cause of charity. University College and the Liverpool Consumption Hospital have also been the recipients of Mr. Hartley's munificence.

The Liverpool Medical Institution and Principal Dale of University College.

A conversazione which was numerously attended was given at the rooms of the Medical Institution on the evening of April 23rd by the President (Mr. Edgar A. Browne) and the members of the council in honour of Mr. A. W. Dale, M.A., the new principal of University College. The most cordial relations have always existed between the members of the medical profession and the staff of the college, and the gathering was conceived with the object of strengthening those ties. The evening passed off in the most harmonious manner, being enlivened by limelight views, songs, and recitations which were rendered by members of the society. The president welcomed Principal Dale in an able and amusing speech, which was feelingly replied to by Mr. Dale, who expressed his pleasure on being introduced to the members of the society in such an agreeable manner.

April 24th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Annual Report of the Medical Officer of Health of Edinburgh.

THE report of the medical officer of the city of Edinburgh for the year 1899, which has just been issued, is a detailed and interesting account of those matters which relate to the public health of the city. The population of the city of Edinburgh, the report informs us, at the middle of the year 1899 was 298,927, or an increase of 3299 persons as compared with the year 1898. The statistics with regard to the number of occupied houses bring out three most satisfactory points: (1) that there is an increasing tendency in the population to seek dwellings in the outskirts of the city where the atmosphere is purer; (2) that in the congested districts of St. Giles, George-square, St. Andrews, and St. Luke's there is a distinct, though small, reduction in the number of occupied houses, while the Canongate is at least not worse in this respect than it was in the previous year; and (3) that the greatest increase in the number of occupied houses occurred in those with a rental of between £10 and £30, while the number of occupied houses under £10 decreased by 571, and of these 318 were houses under £5 rental, thus showing that gradually the poorest and lowest class of house is being evacuated and demolished. The birth-rate for the year was 27·49 per 1000. This rate is considerably lower than the birth-rates of Greenock, Aberdeen, Glasgow, Paisley, Leith, and Dundee. The explanation probably lies in the fact that in busy manufacturing towns the marriage-rate is high and the age of women at marriage is lower. Edinburgh is largely a residential city, with a large professional population among whom the age at marriage is comparatively late. The marriage-rate for the year shows a slight increase. The death-rate was 19·2 per 1000 of the estimated population and numbered 5858. Of these, however, 462 were not regular inhabitants but persons who had come for treatment to one or other of the public institutions or had died during a temporary residence in the city. If this number be deducted the death-rate was 18·85 per 1000 of citizens. Measles, scarlet fever, and diphtheria caused a smaller number of deaths than in the previous year. Sir Henry Littlejohn points out the importance of warding off scarlet fever, as every year diminishes the chance of attack and also the chance of a fatal issue in the event of the disease being contracted. The mortality from whooping-cough was very high; 192 deaths occurred from this disease. Three deaths resulted from typhus fever. Enteric fever caused a greater mortality than usual, 39 deaths having occurred as the result of this disease. A number of deaths were attributed to influenza, but there was no true epidemic. Diarrhœa accounted for 96 deaths, of which 79 occurred under the age of five years. Sir Henry Littlejohn quotes the paper lately published by Dr. Newsholme of Brighton which deals with the results of an investigation made by him into the prevalence of diarrhœa in 31 of the large towns. In one of Dr. Newsholme's tables where the diarrhœa death-rate per 1000 births is given (mean of 17 years 1882–1898) beginning with the town having the lowest death-rate, Edinburgh occupies the fifth place. Sir Henry Littlejohn gives a chart intended to show that deaths from enteritis ought probably to be included among the deaths from diarrhœa, and that therefore the mortality is probably much higher than Dr. Newsholme's statistics go to show. Writing of deaths from cancer the medical officer complains that such deaths are still often certified under such vague terms as "tumour," "abscess," "hæmorrhage," or "cachexia," while many deaths are certified as due to cancer with no indication as to the seat of the disease. Complaint is also made that of the 552 deaths attributed to diseases of the circulatory system no fewer than 139 were certified as due to syncope, and of these 11 were in children under five years of age. Moreover, ill-defined and non-specified causes were stated in 204 instances, of which debility, atrophy, and inanition accounted for the majority. The total number of notifications of infectious diseases during 1899 was 5365. Of these measles accounted for 3600, scarlet fever for 1185, typhoid fever for 289, diphtheria for 279, and typhus fever for 12. The cases of typhus fever were the continuation of the epidemic which occurred in 1898. The medical officer repeats the fact which he pointed out last year—viz., that the Old and New Towns occupied exactly opposite positions in reference to typhoid fever and diphtheria. In regard to diphtheria the New Town is most affected and stands nearly in the same position to the Old Town and southern districts as the Old Town does to the other divisions in regard to typhoid fever. A most interesting section of the report deals with the subject of milk as a source of infection and in it the medical officer gives an account of three outbreaks of scarlet fever and one of typhoid fever where the infection was traced to the milk-supply. In scarlet fever he considers it an important indication that the milk-supply is at fault if a number of adults are attacked by the disease. There were 2010 patients treated in the City Hospital during the year and 440 patients enjoyed the benefits of the convalescent home. During the year 4281 apartments contained in 1723 houses were disinfected and 39 public schools, with 1484 rooms, were fumigated at the request of the School Board, while 23,809 articles of clothing or furniture were disinfected by steam. The report contains 21 tables, many of them very lengthy, and four charts.

The Representation of Edinburgh and St. Andrews Universities.

A vacancy having occurred in the Parliamentary representation of Edinburgh and St. Andrews Universities through the death of Sir William Priestley Sir John Batty Tuke has been adopted as the Conservative candidate for the two universities. The new candidate is a Yorkshireman by birth, but was educated at Edinburgh Academy and at Edinburgh University, while he holds the honorary degree of D.Sc. of Trinity College, Dublin. After graduating in medicine in Edinburgh he acted for six years as medical officer in charge of troops in New Zealand. After returning to this country he held the post of medical superintendent of the Fife and Kinross Asylum for eight years and subsequently took up practice in Edinburgh as a specialist in mental diseases. Sir John Batty Tuke is at present Vice-President of the Royal College of Physicians of Edinburgh

and a member of the General Medical Council. He received the honour of knighthood in 1898.

Edinburgh University Court.

At a meeting of Edinburgh University Court on April 16th it was resolved, after consultation with the Senatus, to admit women to the University classes of diseases of the larynx, ear, and nose. Mr. Thomas M. Burn-Murdoch, M.B., C.M., was appointed University lecturer on Diseases of Children. Ten grants varying from £7 to £50 were made, on the recommendation of the Senatus, from the Earl of Moray Endowment for purposes of original research. On the recommendation of the Senatus it was agreed to appoint Dr. Alexander Bruce, in the event of his services being required during the summer session, to discharge the duties of the chair of Medicine in respect of Clinical Medicine and the reading of theses presented for the degree of M.D.

April 24th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Queen in Ireland.

THE Queen has been graciously pleased to accept in person addresses from the Royal College of Physicians of Ireland and the Royal College of Surgeons in Ireland. In both addresses, after expressions of the complete loyalty of the Colleges, opportunity was taken to refer to the splendid part played by the Irish soldiers in South Africa, and to the generous impulse which has led the Queen to publicly recognise their heroism. The address of the Royal College of Physicians says:—

We are deeply and gratefully sensible of the generous impulse which has prompted your Majesty at this time to visit Ireland and its capital—a gracious recognition of the heroic and conspicuous part which your Majesty's Irish troops have played in the war in South Africa. In this season of trouble you have—as you have ever done—made the trials and sorrows of your people your own, thus drawing their thoughts and hearts ever closer to your Royal person by ties of affectionate regard.

The address of the Royal College of Surgeons says:—

At the present moment a very large proportion of the officers of the Royal Army Medical Corps serving with such distinction in South Africa are Fellows or Licentiates of this College, and it is to us a legitimate source of pride and satisfaction that the valour and devotion displayed by our countrymen serving as combatants in the ranks of your army have been equalled by the devotion and self-sacrifice exhibited by our Fellows and Licentiates as officers of the Royal Army Medical Corps. We humbly desire also to convey to your Majesty the expression of our gratitude for having recently granted to the officers of the Army Medical Service the status and prestige of a Royal Corps. Such action on the part of your Majesty will enable this College to coöperate with your Majesty's advisers in making the Royal Army Medical Corps even more successful in the future than it has been in the past. To assist by every means in our power in all measures intended to strengthen the naval and military forces of the Empire is the highest object of our ambition.

County Antrim Infirmary, Lisburn.

At a meeting of the committee of management held in Lisburn on April 12th attention was drawn by one of the members to the fact that Mr. G. L. St. George, the surgeon of the institution, had treated 669 cases and paid 2005 visits in connexion with what was known as the extern department. All this work was performed gratuitously, while many of the persons assisted were in a position to pay but did not owing to the belief that they were entitled to be relieved gratis. It was a monstrous thing that for a salary of £80 per annum the medical man should be allowed to place the benefit of his skill at the service of many patients who did not pay a farthing. The Act of Parliament did not provide for an extern department and dispensaries for the really poor were in existence. Mr. G. L. St. George said it was not only unfair to himself but to the other medical practitioners that he should give his services free. He had not himself complained of the matter; it was discovered by the Finance Committee. It was decided to consider the question with the view of making a satisfactory arrangement.

Asylum Attendants up to Date.

Dr. George E. Carre, resident medical superintendent of the District Lunatic Asylum, Omagh, reported to a meeting of the governors, held in Omagh on April 12th, that one of the female attendants lately appointed had left the place after being there only a few days; the reason given was because there was no piano for her to play in the institution.

The British Association.

The British Association is to meet at Bradford in 1900 and in Glasgow in 1901. Under its rules the decision as to the place of meeting for 1902 must be taken next September by the meeting at Bradford. An invitation to meet at Belfast in 1902 is to be presented then. The deputation has been appointed and a city meeting will be called to repeat officially the invitation already tendered at the assemblage in Dover last year.

April 24th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Rapid Diagnosis of Rabies in the Dog.

AT the meeting of the Academy of Medicine held on April 10th Professor Cornil read for M. Babès of Bucharest a short paper showing the possibility of making a rapid diagnosis of rabies by an examination of the medulla oblongata and spinal cord of a dog which had inflicted a bite. The process was as follows. 1. A small piece of the brain of the dog was inserted into the brain of a rabbit. 2. A slice of the medulla oblongata of the same dog was hardened in alcohol containing formol; at the end of 24 hours sections were cut from it and stained with carbolised fuchsin, methylene blue, or polychrome. The sections were then dried, mounted, and examined with a low power. If *nodules embryonnaires* were found in the grey substance, together with a perivascular or general *état embryonnaire* and chromatolysis of the nerve elements, this amounted to evidence that the dog was rabid. In all cases in which these bulbar lesions were observed, it was found that the animals inoculated with brain substance from the dog developed symptoms of rabies, while, on the contrary, such symptoms never appeared in rabbits inoculated with brain substance from dogs the medulla oblongata of which did not present any of the above-mentioned alterations.

Regulations affecting Mineral Springs.

In France a mineral spring is not allowed to be developed commercially—that is, the water of it may not be sold for drinking or even for baths—without permission of the Minister of the Interior, who only grants it after the fulfilment of certain specified conditions. Chief among these is the favourable opinion of the Academy of Medicine in connexion with which there is a commission charged exclusively with the making of such examinations. The proprietor of the spring must produce an analysis made at his expense and the commission of the Academy checks it by a second analysis also made at the expense of the proprietor. An engineer proceeds to the locality to make sure that the water is collected under proper aseptic conditions, that it does not undergo any contamination previously to or in the course of, bottling, and that no foreign substance is added to it, not even a gas. These restrictive precautions are not superfluous, since requests for permission to enter into these commercial undertakings are surprisingly numerous and the real object of the authorities is two-fold—firstly, to prevent the inordinate increase of establishments connected with hot springs competing unprofitably with one another, and, in the second place, to save from financial ruin those simple-minded people who whenever they find in their gardens a ferruginous or saline spring of the most ordinary character think that they have a treasure in their possession. The Academy of Medicine has just given a fresh proof of the interest which it takes in this question by adopting, on the recommendation of M. Henriot, a new principle which will enable it to exercise a stricter supervision than hitherto over mineral springs. M. Henriot has observed that even in the case of a well-known and properly authorised spring circumstances may bring about a change in the composition of the water, so that after the lapse of some years the results of analysis may be quite different from those obtained at the time when the authorisation was granted. The circumstances in question may include over-rapid withdrawal of water, unsatisfactory methods of collection, and especially geological phenomena. An example of this kind is supplied by a certain spring, the water of which when bottled has a large sale and is much in request, but which was almost dried up quite 20 years ago after an earthquake. The society which worked it thereupon filled their bottles with water from a neighbouring spring not having quite the same composition, all the time keeping up the old name so as not to lose the commercial value which it had acquired. In the case of some other springs the richness of which in iron, for

example, depends on the proportion and the pressure of the carbonic acid which keeps the iron in solution, escapes of this gas, due to the sinking of other wells in the locality, have greatly reduced the ferruginous quality of the water. The Academy, not being able to interfere with the authorisations granted long ago, has decided that for the future authorisations for the sale of the water of a mineral spring shall only hold good for 30 years and that at the end of that time a fresh inquiry and fresh analysis shall be required.

Oxygen in the Treatment of Sea-sickness.

On April 17th M. Dutremblay read a paper before the Academy of Medicine upon the Treatment of Sea-sickness by Inhalations of Pure Oxygen under Pressure. The first trials of this method were carried out with success by Dr. Dubois, professor at the Faculty of Sciences of Lyons, who considered that the principal cause of sea-sickness lay in the incomplete respiratory exchange which occurs in the lungs. The amount of residual air is thus increased. M. Dutremblay, assisted by Dr. Perdriolat, a medical officer in the service of the Compagnie Générale Transatlantique, made a trial of the remedy upon a number of sea-sick passengers. In his view the disturbances in position of the viscera and the contraction of the diaphragm bring about the secondary manifestations of sea-sickness, such as migraine, vomiting, chilliness, and the like. Under such conditions the use of oxygen is quite justified. The result of a great many trials was that rapid relief was obtained, the nausea and sickness disappeared, the patient felt quite comfortable, and to this there succeeded an interval of quiet and refreshing sleep. The shallow and rapid respiration became more regular, the pulse improved, and the headache disappeared. The patient must take deep and regular inspirations; from 30 to 40 litres are enough to begin with, but this dose may be repeated if necessary. The gas should be inspired through the mouth, the nostrils being kept firmly closed.

April 23rd.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Legislation as to Infectious Diseases.

A BILL on the Prevention of Epidemic Diseases will be discussed in the German Parliament. This Bill provides for the compulsory notification of certain infectious diseases, including cholera, yellow fever, bubonic plague, small-pox, and typhus fever. The notification must be made, not only by the medical man, but eventually by the landlord of the house, the nurse, or the coroner. The district medical officer of health is authorised to examine patients suffering, or suspected to suffer, from the above diseases and has the right of entry to premises where such patients may be. In cases of cholera, yellow fever, and plague a necropsy may be ordered by the local authorities. The medical man in charge of a case is entitled to be present at any examination or necropsy made by the medical officer of health. The medical officer of health is authorised to order a patient to be conveyed to a hospital even against his will if sufficient isolation is not available in his residence. Houses where a case of infectious disease has occurred are to be placarded. Local authorities may order the disinfection of clothing, furniture, rooms, &c., and even the evacuation of dwellings, the owners of course being entitled to claim compensation from the Treasury. Schools may be closed by order of the local authority. There are also special provisions relative to passenger traffic on railways and to the measures to be taken in seaports. The Imperial Health Office will have the duty of seeing that the law is carried into effect. The Bill provides for the creation of an Imperial Council of Health in connexion with the Health Office. This council will be composed of the most eminent hygienists of Germany and is to be consulted by the Government in important questions of public health where the advice of the most competent men is necessary. Hitherto special commissions have been convoked when required, as at the time of the great cholera epidemic, but the Council of Health will be a permanent institution, so that special commissions will become unnecessary. One of the principal duties of the council will be the revision of the German Pharmacopœia. The President of the Imperial Health Office will also be President of the Council of Health. The "plenum" of the council will be convoked only on rare occasions, such as in times of epidemics, but sub-committees will meet regularly for special purposes. In an article published in the *Deutsche Medicinische Wochenschrift* Professor Kolle, of the Institution of Infectious Diseases, approves of the general principles of the Bill, but argues against its limitation to diseases of essentially foreign origin and the non-inclusion of diseases long-established in Germany, such as diphtheria and typhoid fever. A correspondent of the *Vossische Zeitung* draws attention to the preponderance given to the Government medical officers by the Bill. He asks whether those gentlemen have had an opportunity of seeing more cases of yellow fever, cholera, &c., than the civilian practitioners, and in the event of their not having had such opportunities he inquires why the right of officially deciding questions relative to epidemic disease should be conferred on them exclusively. The duties of the Government medical officers have been increased so much by this and other enactments that they will scarcely have time for private practice, although the smallness of their salaries compels them to engage in it. Better remuneration and better training of the medical officers would contribute much to the utility of the Bill.

The German Ambulances with the Boers.

The central committee of the German Red Cross Society has received reports from the German ambulances with the Boer forces. One ambulance is in Jacobsdal and the other in Bloemfontein. The members of the Jacobsdal ambulance were in great danger during the battles in February and were overwhelmed by the amount of work in the field hospital and on the battle-field. Jacobsdal is, of course, now in possession of the British; the patients in the field hospital are still for the most part Boers, only a few of them being British. At the special request of Lord Roberts the British Government has instructed the British Ambassador in Berlin to express his thanks to the German Red Cross Society for the help afforded to the sick and wounded. The Boer authorities have also stated that the German ambulance did excellent work during the harassing days before the surrender of General Cronje and afterwards. A third German ambulance is now on the way to South Africa where it will assist the members of the first two ambulances and supply them with a new stock of dressing material, &c.

Collective Investigation on Venereal Diseases.

A collective investigation on the spread of venereal diseases is being carried out in Prussia during this month. The medical profession throughout the country has been provided with vouchers on behalf of the medical chambers and has been requested to state the number of patients treated during the month of April. In the voucher there are different columns for patients suffering from gonorrhœa and its sequelæ, from soft sore, and from syphilis. The male and the female patients are to be classified separately. The vouchers must be sent to the presidents of the medical chambers of each province and will be delivered to the Government medical department, where they will be collected and the results published. The medical departments both of the army and of the navy will contribute to the investigation.

April 23rd.

Obituary.

ROBERT WILLS SOPER, M.R.C.S. ENG., L.S.A., J.P.

MR. ROBERT WILLS SOPER died at his residence, Prospect House, Dartmouth, Devon, on April 12th, from the effects of a chill contracted a fortnight previously whilst attending a funeral. Mr. Soper received his medical education at St. Mary's Hospital, London, and became qualified as M.R.C.S. Eng. and L.S.A. in 1863 and 1864 respectively. After holding resident appointments at St. Mary's Hospital, the Sheffield General Infirmary, and the South Devon and East Cornwall Hospital, Mr. Soper went to Dartmouth where he soon established an extensive practice. At the time of his death he held several appointments, being medical officer of health of the borough and port of Dartmouth, medical officer of the twelfth district, Totnes Union, the first and second districts, Kingsbridge Union, medical inspector to the Board of Trade, certifying factory surgeon, and also Admiralty surgeon and agent.

The deceased was a justice of the peace for Dartmouth. Mr. Soper, who was 58 years of age, was extremely popular and will be much missed in Dartmouth, where sincere sympathy is felt for his widow and children. He took a great interest in yachting and was a prominent member of the Start Bay Yacht Club. The funeral on April 17th was largely attended; amongst those present were the mayor and corporation, the magistrates, officers of H.M.S. *Britannia*, clergy, and members of the medical profession.

EDWIN VAN MILLINGEN, M.D. WURTZBURG.

WE have to record the death of Dr. Edwin Van Millingen of Constantinople, where he established himself as an ophthalmic and aural surgeon in 1874. He was an Englishman, was born in 1851, studied medicine in the University of Würtzburg, and graduated there as M.D., after which he studied ophthalmology and otology in Vienna. He was attached as a specialist to the British, French, and Italian hospitals in Constantinople, and was for a time similarly attached to the hospital of the Imperial Admiralty. He was appointed by the Sultan first ophthalmic and aural surgeon to the Imperial Court, and later was named Professor of Ophthalmology to the Imperial School of Medicine. He died in the British Hospital on April 7th from pneumonia following influenza.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—In April the following candidates passed in the subjects indicated:—

Surgery.—A. St. J. Bateman (Section I.), King's College Hospital; W. A. C. Cox (Section I.), St. Mary's Hospital; H. S. A. Davies (Section I.), Michigan; R. F. Ellery (Sections I. and II.) and F. E. Feilden, St. Bartholomew's Hospital; R. T. Forster (Sections I. and II.) and J. E. Howroyd (Section I.), Leeds; D. T. C. Jones (Section II.), University College Hospital; O. E. Lemin (Section II.), London Hospital; J. C. S. Rashleigh (Section I.), St. George's Hospital; and G. E. Seville, Manchester.

Medicine.—F. E. Featherstone (Section I.), Guy's Hospital; R. T. Forster (Section II.), Leeds; W. D. French (Section II.), University College Hospital; J. S. Goodall (Section I.), Middlesex Hospital; T. E. Holman, Guy's Hospital; J. E. Howroyd (Section I.), Leeds; C. Johnson (Section I.), Durham and London Hospital; O. E. Lemin (Section II.), London Hospital; G. M. Smith, St. Thomas's Hospital; and C. E. Williams, R.C.P. & S., Kingston, Ontario.

Forensic Medicine.—A. St. J. Bateman, King's College Hospital; F. H. Featherstone, Guy's Hospital; J. S. Goodall, Middlesex Hospital; T. E. Holman, Guy's Hospital; J. E. Howroyd, Leeds; C. Johnson, Durham and London Hospital; R. O. Jones, Guy's Hospital; W. Miles, Middlesex Hospital; G. M. Smith, St. Thomas's Hospital; and C. E. Williams, R.C.P. & S., Kingston, Ontario.

Midwifery.—P. D'E. Burrell, St. George's Hospital; W. T. Harris, St. Thomas's Hospital; W. T. Meagher, Cork; D. V. Muller, Charing-cross Hospital; R. C. Rumbelow, Middlesex Hospital; and H. Smith, Birmingham.

The diploma of the Society was granted to the following candidates, entitling them to practise Medicine, Surgery, and Midwifery: P. D'E. Burrell, R. F. Ellery, F. E. Feilden, R. T. Forster, T. E. Holman, D. T. C. Jones, O. E. Lemin, and G. E. Seville.

UNIVERSITY OF EDINBURGH.—The following is the official list of candidates who have passed the undermentioned examinations for degrees in Medicine and Surgery:—

First Professional Examination.—Farhat Ali, Mark Ashkenazie, Agnes Balfour, C. M. Begg, A. R. Berrie, J. M. Beyers, A. S. L. Biggart, F. H. Borthwick, F. S. Brennan, James Brennan, Angus Buchanan, R. B. Calwell, M. C. Cowper, R. W. Craig, C. S. Crichton, George Cunningham, W. R. Davison, J. R. Dobbin, T. H. Easton, C. G. Edmonston, J. J. H. Ferguson, F. S. B. Fletcher, N. C. Forsyth, R. H. Fothergill, H. M. Gillespie, J. A. Glover, L. C. V. Hardwicke, George Harrison, Ephraim Henderson, M.A., G. S. Husband, R. J. Irving, S. A. Johnston, I. C. Keir, John Kirk, E. A. Klein, W. E. Knight, C. A. Lawrence, C. D. Lochrane, J. B. Lockerbie, A. P. G. Lorimer, John M'Donald, R. J. Mackessack, M.A., Elspeth M. Macmillan, D. P. Marais, J. B. Mears, C. R. P. Mitchell, Helen Morison, T. B. Mouat, C. F. A. Oberlander, Archibald Oliver, Frank O'Neill, E. H. Price, Labbhu Ram, William Readman, A. R. C. Rees, D. G. Reid, A. O. P. Reynolds, W. H. Robertson, L. C. Robinson, John Saffley, S. W. Smith, W. A. Wilson Smith, H. A. Stewart, H. J. Stewart, A. C. Strain, Annie F. Theobalds, T. T. Thomson, B. A. Turpin, D. C. Welsh, Leonard West, R. M. Manwaring White, and D. P. D. Wilkie.

Second Professional Examination.—A. K. Baxter, Henry Beveridge B.A., Breadalbane Blacklock, C. H. Bösenburg, J. R. Bosman, R. A. Braine, G. B. Brand, R. D. Brown, Archibald Brownlie, D. M. Callender, M.A., C. M. Campbell, M.A., D. G. Carmichael, T. F. Cavanagh, A. M. Caverhill, J. H. Connolly, P. D. Cremona, T. M. Cuthbert, F. I. Dawson, Jan Dommisse, H. J. Dunbar, J. F. Duncan, John Dunlop, S. A. Ellerbek,* S. C. Ellison, A. N. Fell, A. P. R. Fennell, Sidney Gilford, Archibald Gillespie, A. M. Gloag, D. P. Goil,* Wilbert Goodchild, Andrew Grant, J. P. Grant, J. A. Gray, J. F. Haegert, T. B. Hamilton,* Howard Harding, A. W. M. Harvey, Henry Herd, M.A., Matthew Holmes, C. H. Houghton, R. C. Irvine, J. M. Johnstone, Harold Kerr, James Kirkwood, H. A. Knight, W. S. Laidlaw, Norah Lenwood, William Lilico, J. C. London, R. C. Low, J. C. M'Caughey, D. R. MacGregor, B.Sc., I. N. M'Kesnd, V. C. M'Laren, Evan Macmillan, R. P. M'Neil, C. E. Marshall, W. B. Marshall, J. G. Mason, J. K. Matheson, Paul Matthews,* R. J. Mayberry, Thomas Mill, W. S. Milne, Anthony Moll, J. H. Montgomery, S. A. Moore, Robert Morison, Robert Murray, Charles Nelson, William Newlands, E. G. O. Nixon, T. H. Osler, John Politachi, A. B. dos Remedios, H. H. Roberts, A. B. Ross, T. W. E. Ross, A. J. Rowan, A. L. Roxburgh, James Scobie, J. S. Sewell, A. M. Sharp, M.A., E. S. Sharp, C. J. Shaw, W. F. Smesell, J. M. Smith, M. S. Sodhi, D. L. Wall, B. P. Watson,* John Weir, and S. A. K. Wilson.

Second Professional Examination (Old Regulations).—M. N. Bose, M. G. I. Cadell, Shaik Dawood,* J. H. Meikle, M.A., B.Sc., A. C. Peterson, D. R. Rees, and W. H. Swaffield.

Third Professional Examination.—May Agnew, J. F. Allan, C. M. Anderson, R. T. Baillie, A. C. Begg, R. A. Bellilios, V. C. de Boinville, R. J. Bradley, A. J. Brock, James Brocket, E. E. Brown, G. M. Brown, William Brown, James Brownlee, Launcelot Bruce, R. W. Buchanan, Henry Buist, G. C. Burgess, R. P. Calder, Kirkland Chapel, C. C. Choyce, P. T. Copeland, W. J. Crow, B. M. Cunningham, John Dalgliesh,* M. S. Dickson, W. E. C. Dickson, B.Sc., T. G. B. Dodds, Henry Dodgson, Charles Douglas, J. L. Duncan, W. A. Duncan, J. M. Dupont, J. R. Edward, William Eggling, J. W. Falconer, Stephen Garvin, E. M. Glanville, R. A. Glegg, Thomas Graham, R. M. Grant, A. L. Gurney, A. R. Hallam, James Halliday, A. M. Hamilton, William Hamilton, N. C. R. Hansen, R. A. J. Harper, E. R. Henderson, D. C. Henry, C. W. Howe, Andrew Hunter, M.A., B.Sc., A. R. Hunter, A. R. Johnston, D. Edgar Jones, A. C. Keay, J. P. Kennedy, P. V. Langmore, A. R. Khan Lauddie, William Lee, J. G. M'Bride, J. B. M'Cutcheon, William MacDougall, P. F. M'Farlan, George M'Farland, F. D. S. MacKenzie, John M'Kenzie, K. D. C. MacRae, William Mair, A. M. Malcolmson, A. F. G. Masson, E. C. C. Maunsell, G. R. Mill, William Miller, M. C. Morgan, John Morrison, David Munro, J. G. Munro, G. S. Murray, Peter Murray, D. A. Ogilvie, J. F. Orr, J. L. Palmer, W. S. Patton, S. G. Pell, George Pereira, H. G. Pesel, L. W. Pole, W. H. Prentice, M.A., H. St. J. Randell, H. M. Roberts, G. C. I. Robertson, M. W. Robertson, W. A. Robinson, Laurence Rundall, C. W. Saleeby, T. B. Shaw, M. M. Smith, T. A. Smyth, Kate Southon, H. L. Shark, A. J. de Spiganovicz, M. M. Stevenson, D. A. Stewart, T. L. Thomson, E. A. Walker, A. R. Wallis, Edwin Wells, T. S. E. Williams, F. E. Wilson, James Woods, David Young, and R. T. Young.

* Passed with distinction.

CARMARTHEN INFIRMARY.—The annual meeting of the subscribers and friends of this institution was held on April 12th. The medical staff reported an increase in the work and the financial statement showed that the total receipts amounted to £1721 and the expenditure to £1885.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—In recognition of the Royal visit the Council has resolved to grant the Primary Fellowship Examination to all students of the College who pass the second professional examination on or before July 31st, 1900, on fulfilling the other necessary conditions. This resolution applies to Licentiates, whether under or over 10 years' standing, and to all students who pass the second professional examination for the conjoint diploma of the two Royal Colleges. The second professional examination and the examination in physiology must be completed. All persons wishing to obtain the benefit of this resolution must claim the benefit before July 31st, 1900. All applications are to be addressed to the Registrar of the College.—The following is the prize list for the winter session. Descriptive Anatomy: Junior—J. S. Shiell, first prize (£3) and medal; and J. J. Connolly, second prize (£1) and certificate. Senior—J. Cockburn, first prize (£3) and medal; and R. W. Burkitt, second prize (£1) and certificate. Practical Anatomy: First year—Miss J. C. Hargrave, first prize (£3) and medal; and A. N. Crawford, second prize (£1) and certificate. Second year—E. C. Byrne, first prize (£3) and medal; and R. G. Allen, second prize (£1) and certificate. Third year—A. Charles and T. A. Dillon (equal), first prize (£3) and medal; and C. W. Ewing, second prize (£1) and certificate. Practice of Medicine: A. Charles, first prize (£3) and medal; and J. F. Peart, second prize (£1) and certificate. Surgery: C. W. Ewing, first prize (£3) and medal; and J. F. Peart, second prize (£1) and certificate. Midwifery: W. R. Meredith and J. F. Peart (equal), first prize (£3) and medal; and Miss M. J. Shire, second prize (£1) and certificate. Physiology: J. P. Ziervogel, first prize (£3) and medal; and R. W. Burkitt, second prize (£1) and certificate. Chemistry: B. H. Peters, first prize (£3) and medal; and F. O'D. Fawcett, second prize (£1) and certificate. Pathology: J. M. S. Levis, first prize (£3) and medal; and T. J. Tallon, second prize (£1) and certificate. Physics: Miss J. C. Hargrave, first prize (£3) and medal; and M. Lochrin, second prize (£1) and certificate.

DIFFICULTIES UNDER THE WORKMEN'S COMPENSATION ACT.—At the Pontypridd County-court held recently before His Honour Judge Gwilym Williams, a collier who had worked at the Great Western Colliery for 52 years claimed 3s. per week from the company, being half the wages he earned before the accident in September last. Medical evidence showed that the plaintiff was now suffering from rheumatism in the shoulder-joints and not from the effects of the accident, but that there might be slight traces of the accident left. His Honour said that such cases were very difficult to decide, as he had to depend absolutely on the medical evidence, and medical evidence could not always define with sufficient accuracy the extent to which an applicant was incapacitated. Eventually judgment was given for 5s. a week.

PRESENTATIONS TO MEDICAL MEN.—Mr. John Jones, M.D., B.S. Lond., of Clydach, Swansea, at a meeting held on March 21st in the Public Hall in that town on the occasion of his leaving for the front, having been appointed a civil surgeon to Her Majesty's forces in South Africa, was presented with a purse containing £50 in gold, a briar pipe, and tobacco.—At St. Tudy, Cornwall, on March 26th, the members of the St. John ambulance class presented Mr. William Robert Newton Cole, M.D., M.Ch. R.U.I., with a barometer in appreciation of his services as honorary lecturer.—At the East Looe (Cornwall) Guildhall on March 28th the members of the St. John ambulance class presented Mr. Leonard Frank Houghton, L.R.C.P. Lond., M.R.C.S. Eng., with a smoking cabinet of oak bearing the inscription: "Presented to Dr. L. F. Houghton by the members of the St. John Ambulance Class, East Looe, in recognition of his services, 1897-8-9."—The nursing staff of the Royal Devon and Exeter Hospital on March 28th presented Mr. W. Ashford, L.R.C.P. Lond., M.R.C.S. Eng., the assistant house surgeon, with a travelling case. Mr. Ashford has been accepted for service with the South African Field Force.—On March 29th Mr. Frank Woods, L.R.C.P. Lond., M.R.C.S. Eng., L.S.A., of Timsbury, near Bath, who is leaving the neighbourhood, was entertained at a dinner in that town. Mr. Hayward, the chairman, presided over a large assembly, and in the course of the evening presented Mr. Woods with a silver salver as a slight token of the esteem in which he was held by the inhabitants of the district.—Mr. S. Finlay, F.R.C.S. Irel., and Mrs. Finlay were, on Jan. 3rd, entertained at Dungog, New South Wales, at a farewell social meeting prior to their leaving for Sydney, when Mr. Finlay was presented with an address by the residents of the district and Mrs. Finlay was the recipient of a valuable piece of plate.—The medical friends of Mr. S. C. Jamieson, M.B., Ch.M. Melb., of Hobart, Tasmania, who has proceeded to South Africa, met recently in that town and presented him with an Albert chain and Maltese cross.—At Shaldon, Teignmouth, recently, Mr. Bird, the chairman of the Shaldon Technical Education Committee, on behalf of the ladies who have attended a course of lectures on "First Aid to the Injured and Sick Nursing" given by Mr. William Ker Bell, L.R.C.P. Lond., M.R.C.S. Eng., presented to that gentleman a dressing and travelling bag in appreciation of his services as honorary lecturer.—At the Cawdor Arms Hotel, Llandilo, Carmarthenshire, on April 5th the Honourable Gwenllian C. Rice, of Dynevor Castle, on behalf of friends in the town and neighbourhood, presented to Mr. William Howell Lloyd, M.R.C.S. Eng., L.S.A., Surgeon-Captain of the 1st Volunteer Battalion the Welsh Regiment, medical officer of health of the Llandilo rural and urban districts, and deputy-coroner for the eastern division of Carmarthenshire, an address, accompanied by a brougham and a purse containing £120, as a mark of respect and esteem upon the occasion of his silver wedding.—Considerable sympathy has been felt with Mr. E. W. Jollye, M.R.C.S. Eng., of Donington, Lincolnshire, by his friends and neighbours in consequence of a recent action at law against him which was dismissed with costs. Mr. Jollye has been a resident at Donington and carried on a professional practice there for many years and is highly esteemed. He has just been presented with a silver salver, on which is engraved an appropriate inscription, and a cheque for upwards of £200, which covers the costs he incurred in defending the action.—Mr. W. R. Williams, L.R.C.P., L.R.C.S. Edin., L.F.P.S. Glasg., of Machynlleth, was the recipient on April 5th of a marble timepiece from the members of a large local ambulance class as an acknowledgment and appreciation of his first-aid instructions.—At the Village Hall, Addlestone, on April 10th, on the presentation of certificates to members of the local ambulance class, in connexion with the St. John Ambulance Association, Mr. J. L. A. Hope, L.R.C.P. Lond., M.R.C.S. Eng., was the recipient of a silver-mounted oak tea-tray, as a token of appreciation of his able gratuitous lectures to the class.—At a smoking concert, in the men's mess-room at the New Cross railway-station, London, on April 21st, Mr. J. M. Carvell, M.R.C.S. Eng., of Catford, was the recipient of a gold-mounted umbrella from the members of the ambulance corps of the New Cross and Willow Walk Division, of which he is the honorary surgeon.

COMPLIMENTARY ENTERTAINMENT.—On April 19th Mr. N. McIntire Falkiner, M.B., B.Ch. Dub., F.R.C.P. Irel., of Dublin, was entertained to dinner at the Dolphin Hotel and was presented with an illuminated address by the poor-law and medical officers of health of the Dublin Metropolitan District, on the occasion of his appointment as medical superintendent of Charlemont House and as a mark of their good wishes. Sir Charles Cameron occupied the chair and in proposing the toast of the evening, "Our Guest," remarked on Dr. Falkiner's amiability, by which he had gained the esteem of his many friends, and on his capabilities as a physician and sanitarian.

THE BRADFORD SANITARY ASSOCIATION.—The report of this association, of which Dr. H. Johnstone Campbell is president and Mr. P. E. Miall vice-president, states that the total number of members for the year 1899 was 100, as compared with 104 for the previous year. The total number now on the roll is 103. Discussing the prevalence of influenza the report calls attention to the fact that too much reliance is placed upon medicine and isolation hospitals by the general public for cure and pleads for a more intelligent grasp of sanitary principles. The seed of a plant which germinates best on soils suitable to its nature is given as an illustration of how the disease gains entrance to the body.

UNIVERSITY OF CAMBRIDGE.—At a meeting of the Governors of Addenbrooke's Hospital on April 23rd Professor Clifford Allbutt was unanimously elected an honorary physician to the hospital. The following were elected the University Representatives on the Advisory Council established under the new agreement with the Senate: Dr. Porter, Dr. D. MacAlister, Mr. C. J. Clay, Mr. H. M. Taylor, and Mr. G. B. Finch. Five members to represent the county and five to represent the borough were elected at the same time. The compact with the University has thus been carried out, and there is reason to hope that the results will be highly beneficial both to the charity and to the medical school.—Mr. R. H. Yapp has been appointed assistant-curator of the Herbarium in the Department of Botany.—The plans for the new Medical School buildings come up for discussion in the Senate on May 5th.—The final examinations for the M.B. and B.C. degrees began on April 24th and will continue till May 3rd.—Professor J. G. Adami has been appointed a delegate to represent the University at the centennial celebration of the University of New Brunswick in May.—Mr. G. Cunningham will represent the University at the Dental Conference to be held in Paris in August next.

VACCINATION FEES.—It seems that the Bury Board of Guardians are dissatisfied with the amount of the vaccination fees which they have to pay and have been in correspondence with the Local Government Board on the matter. The guardians proposed to the Board that the fees should be reduced to the minimum in Article 20 of the Vaccination Order, 1898, but were told that the Board were not satisfied that the amounts received by the vaccination officers in respect of the year 1899 were unduly large having regard to the increased amount of work which had devolved upon them. Considerable arrears had accumulated and some of these in 1899 had added to the vaccination officers' incomes. Nor did the Board think that increased activity, causing a larger number of vaccinations, should be made a ground for the immediate reduction of fees. A second communication with regard to a reduction of fees again pointed out that though there was a considerable increase in the amounts paid for the first three quarters of 1899 over those paid in 1898 it should be remembered that in 1898 vaccination was almost entirely in abeyance in the union and that many vaccinations were of children in

arrear. The Board considered that the guardians should give the new system a longer trial before they cut down the fees, for there was more work to do than formerly. It seems strange that such obvious facts should have to be pointed out to the guardians. The result of the subsequent discussion was that the letters were referred to a committee for consideration.

VACCINATION LAW.—At Frome, Somerset, the bench of magistrates recently dismissed two summonses against residents at Nunney for failing to have their children vaccinated, owing to the vaccination officer having signed the requisite notices in the wrong place.

INSPECTION OF MEAT.—At the last meeting of the Swansea Town Council it was decided to appoint a meat and veterinary inspector at a salary of £200 per annum.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward it to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, for publication in the next number.

BENDLE, J. H., M.B. Lond., L.R.C.P., M.R.C.S., has been appointed Senior House Surgeon to the County Hospital, Yorkshire.

BIRD, G. W. HARVEY, M.A., M.B., B.C. Cantab., M.R.C.S., L.R.C.P., has been appointed Surgeon to the Bridgwater Infirmary.

BOAKE, SAMUEL, L.R.C.P., L.R.C.S. Irel., has been appointed Medical Officer of Health for Ilminster, and also Medical Officer for the No. 1 (Ilminster) District by the Chard Board of Guardians, vice E. Stephens, deceased.

BOX, CHARLES RICHARD, M.D., B.S., B.Sc. Lond., M.R.C.P., F.R.C.S., has been appointed Assistant Physician to St. Thomas's Hospital.

BYRNE, L. A., L.R.C.P. Irel., F.R.C.S., has been appointed Coroner for the City of Dublin, vice T. E. Kenny.

DAVIES, J. L., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer to the workmen at the Old Castle Works, Llanelly.

GRIEVE, R., M.D., C.M. Edin., has been appointed Honorary Assistant Surgeon, Hull Royal Infirmary, vice H. W. Pigeon.

HARRIS, JOHN HENRY, M.R.C.S., L.S.A., D.P.H. Cantab., has been appointed Surgeon in charge of troops, Castle Fort, vice R. W. Soper, deceased.

JONES, D. WILLIAMS, L.R.C.P., L.R.C.S. Edin., L.S.A. Lond., has been appointed Medical Officer and Public Vaccinator to the Rotherham No. 1 District, vice Branson, resigned.

MACPHERSON, J. F., M.B., C.M. Edin., has been appointed Medical Officer for the First Sanitary District of the Basingstoke Union, vice C. F. Webb, resigned.

MAIDLOW, W. H., M.D. Durh., B.S., F.R.C.S. Eng., has been appointed Medical Officer of Health by the Ilminster District Council.

MASSEY, D., L.R.C.P., L.R.C.S. Irel., has been appointed Medical Officer of Health for the Berriew Sanitary District of the Forden Union.

MCNABB, H. J., M.B., C.M. Irel., has been appointed Assistant Medical Officer to the County Down Infirmary.

NEWMAN, G., M.D. Edin., D.P.H. Camb., has been appointed, *pro tem.*, Medical Officer for Clerkenwell.

ROBERTS, J. L., M.D. Lond., B.Sc., F.R.C.S. Eng., has been appointed Honorary Physician, Stanley Hospital, Liverpool, vice R. I. Richardson, resigned.

ROYAL, WILLIAM JOHN, L.D.S., F.P.S. Glasg., has been appointed Honorary Dental Surgeon to the Royal United Hospital, Bath, vice Charles Gaine, resigned.

SPON, H. J., L.R.C.P. Lond., M.R.C.S., D.P.H. Camb., has been appointed Visiting Medical Officer to the City Dispensary, College-street, London, E.C.

SPROULLE, A. E., L.R.C.P., L.R.C.S. Irel., has been re-appointed Medical Officer of Health by the Withernsea Urban District Council.

WALKER, J. D., M.B., C.M. Aberd., has been appointed Medical Officer for the Fontmell Sanitary District of the Shaftesbury Union, vice H. A. Bryant, resigned.

WOOD, JAMES MILLER SWANSON, M.B., Ch.B., has been appointed Assistant Medical Officer to the James Murray's Royal Asylum, Perth.

WORTH, ERSKINE HERBERT, L.R.C.P. Lond., M.R.C.S., L.S.A., of St. Day, Cornwall, has been accepted for service with the troops in South Africa.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BIRKENHEAD AND WIRRAL CHILDREN'S HOSPITAL, Woodchurch-road, Birkenhead.—House Surgeon. Salary £75, with board, residence, and laundry. Apply to the Hon. Secretary, 20, Chapel-street, Liverpool.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Birmingham.—Assistant House Surgeon. Salary £60 per annum, with apartments and board.

BIRMINGHAM AND MIDLAND FREE HOSPITAL FOR SICK CHILDREN, Birmingham.—Resident Medical Officer and Resident Surgical Officer. Salaries of £60 per annum each, with board, washing, and attendance at the hospital.

BRISTOL ROYAL INFIRMARY.—Casualty Officer, to hold office until August 31st. Honorarium £10, with apartments, board, and washing.

BRITISH NORTH BORNEO.—Two Medical Cadets. Apply to the Secretary, the British North Borneo Company, 15, Leadenhall-street, London, E.C.

CARDIFF INFIRMARY.—Assistant House Physician for six months. Salary at the rate of £50 per annum, with board, washing, and apartments.

CARLISLE DISPENSARY.—House Surgeon. Salary £130 per annum, with apartments (not board).

CHELSEA HOSPITAL FOR WOMEN, Fulham-road, S.W.—Clinical Assistant. Tenable for three months on payment of £8 8*s*.

CHORLTON UNION.—Senior and Junior Resident Medical Officers at the Workhouse Hospitals, Withington, Manchester, for twelve months. Salary of Senior Officer £130, and of Junior Officer £120, with furnished apartments and attendance (but not rations) for each in the workhouse.

CITY ASYLUM, Birmingham.—Resident Clinical Assistant.

CITY ASYLUM, Nottingham.—Second Assistant Medical Officer, unmarried. Salary £150, with board, apartments, and washing.

COUNTY ASYLUM, Rainhill, near Liverpool.—Assistant Medical Officer to act as Locum Tenens for about four months during the summer. Salary £3 3*s*. per week, with furnished apartments and board.

DENBIGHSHIRE INFIRMARY, Denbigh.—House Surgeon for 12 months. Salary £80 to commence, with board, residence, and washing.

DEWSBURY AND DISTRICT GENERAL INFIRMARY.—House Surgeon. Salary commencing £80 per annum, with board, residence, and washing.

FARRINGDON GENERAL DISPENSARY, 17, Bartlett's-buildings, Holborn-circus, London.—Resident Medical Officer. Salary £120 per annum, with apartments, coals, gas, and attendance and permission to take resident pupils.

GLAMORGAN COUNTY ASYLUM, Bridgend.—Junior Assistant Medical Officer. Salary £150, with board, apartments, washing, and attendance.

HOSPITAL FOR DISEASES OF THE THROAT, Golden-square, London.—Senior Clinical Assistant.

HOSPITAL FOR WOMEN, Soho-square, London.—House Physician for six months. Salary £30 for that period.

LEEDS PUBLIC DISPENSARY.—Junior Resident Medical Officer. Salary £85 per annum.

LIVERPOOL EYE AND EAR INFIRMARY.—House Surgeon. Salary £60, with residence and maintenance.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W.—Assistant Resident Medical Officer for six months. Honorarium given at the rate of 50 guineas per annum, residence in the hospital, with board and washing.

MANCHESTER ROYAL INFIRMARY.—Surgical Registrar (non-resident). Salary £80 per annum.

MILLER HOSPITAL AND ROYAL KENT DISPENSARY, Greenwich-road, S.E.—Junior Resident Medical Officer for six months. Salary at the rate of £40 per annum, with board, attendance, and washing.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC (Albany Memorial), Queen-square, Bloomsbury, London.—Two Assistant Physicians.

NORTHAMPTON UNION.—Medical Officer for a district. Salary £70 per annum, subject to superannuation deduction.

NORTH-WEST LONDON HOSPITAL, Kentish Town-road.—Resident Medical Officer and Assistant Resident Medical Officer for six months. Salaries at the rate of £50 per annum each.

PARISH OF ST. MATTHEW, Bethnal-green, London.—Assistant Medical Officer at the New Infirmary, Cambridge-road, N.E., unmarried. Salary £150 per annum, with board, lodging, and washing. Also Second Assistant Medical Officer for the New Infirmary, Cambridge-road, N.E., unmarried. Salary £120 per annum, with board, lodging, and washing. Applications to the Clerk to the Guardians, Offices, Bishop's-road, Victoria-park, N.E.

PECKHAM HOUSE, Peckham.—Assistant Medical Officer. Salary £150 per annum.

POPLAR HOSPITAL FOR ACCIDENTS, Poplar, London.—Assistant House Surgeon for six months. Salary at the rate of £65 per annum, with board and residence.

RIPON DISPENSARY AND COTTAGE HOSPITAL, Ripon.—Resident House Surgeon and Dispenser, unmarried. Salary £70 first year, to be advanced afterwards, with board and lodging.

ROYAL LONDON OPHTHALMIC HOSPITAL (MOORFIELDS EYE HOSPITAL), City-road, E.C.—Three Assistant Surgeons.

ROYAL NATIONAL HOSPITAL FOR CONSUMPTION AT VENTNOR.—Clinical Assistant. Board, residence, and laundry provided. Apply to the Secretary, London office, 34, Craven-street, Strand, W.C.

ST. MARY'S CHILDREN'S HOSPITAL, Plaistow, E.—Assistant Resident Medical Officer, unmarried. Salary £80 per annum, with board, residence, laundry, &c.

SALFORD ROYAL HOSPITAL.—Honorary Medical Officer for the Pendleton Branch Dispensary.

SALOP INFIRMARY, Shrewsbury.—Assistant House Surgeon for six months. Salary at the rate of £40 per annum, with board and washing.

SCARBOROUGH HOSPITAL AND DISPENSARY.—Junior House Surgeon for six months. Salary £50 per annum, with residence, board, and washing.

SOUTH DEVON AND EAST CORNWALL HOSPITAL, Plymouth.—Assistant House Surgeon for six months. Salary at the rate of £50 per annum, with board and residence.

STAFFORDSHIRE GENERAL INFIRMARY, Stafford.—House Surgeon for two years. Salary £120 per annum, with board, lodging, and washing. Also Assistant House Surgeon. Salary £80 per annum, with board, lodging, and washing.

STOCKPORT INFIRMARY.—House Surgeon. Salary £100 per annum, with residence, board, and washing. Also Assistant House and Visiting Surgeon. Salary £70 per annum, with board, washing, and residence.

SWANSEA GENERAL AND EYE HOSPITAL.—House Surgeon for twelve months. Salary £50 per annum, with board, apartments, washing, and attendance.

VICTORIA HOSPITAL FOR CHILDREN, Queen's-road, Chelsea, S.W.—Resident Medical Officer for six months. Honorarium £25, with board and lodging in the hospital. Also Assistant Physician to the Out-patients for two years.

WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL.—House Physician for two years. Salary £100 a year, with board, lodging, and washing. Also Assistant House Physician for six months. Honorarium at the rate of £50 per annum given, and board, lodging, and washing provided.

YORK DISPENSARY.—Resident Medical Officer, unmarried. Salary £110 a year, with board, lodging, and attendance.

YORK LUNATIC ASYLUM, Bootham, York.—Assistant Resident Medical Officer. Salary £110 a year, with board, washing, and attendance.

Births, Marriages, and Deaths.

BIRTHS.

BARTON.—On April 17th, at Radcliffe-gardens, South Kensington, S.W., the wife of Charles N. Barton, L.R.C.P. Lond., M.R.C.S., of a son.

BROWNE.—On April 22nd, at Avonside, Warwick, the wife of Sam Browne, M.D. Irel., late R.N., of a daughter.

CLARKE.—On April 18th, at Mansfield-road, Nottingham, the wife of Frederick Adderley Howard Clarke, M.R.C.S., L.R.C.P. Lond., of a son.

GARDENER.—On April 20th, at Darley House, Venner-road, Sydenham, the wife of W. F. Gardener, M.R.C.S., L.R.C.P., of a son.

HICKMAN.—On April 21st, at Broadhurst-gardens, South Hampstead, the wife of H. R. Belcher Hickman, M.B., of a daughter.

MILLIGAN.—On April 18th, at Westbourne, Rusholme, Manchester, the wife of William Milligan, M.D., of a daughter.

OXLEY.—On April 18th, at Shanklin Villa, Buckhurst Hill, the wife of Fredk. J. Oxley, M.R.C.S., L.R.C.P., of a daughter.

PARRY.—On St. George's Day, at The Turret House, Youlgreave, Derbyshire, the wife of T. Wilson Parry, M.A., M.B., B.C. Cantab., L.R.C.P. Lond., M.R.C.S. Eng., of a son.

SANDERSON.—On April 16th, at Brunswick-square, Brighton, the wife of Robert Sanderson, M.B. Oxon, of a daughter.

SHAPLAND.—On April 23rd, at Burnside, Exmouth, the wife of John Dee Shapland, M.R.C.S., of a daughter.

STEINHAEUSER.—On April 16th, at St. Andrew's, Lewes, Sussex, the wife of J. R. Steinhaeuser, M.B., B.S., of a daughter.

TWINING.—On April 22nd, at Holm Leigh, Salcombe, South Devon, the wife of V. W. Twining, M.B., of a daughter.

MARRIAGES.

BROWN—POULTER.—On April 19th, at Leytonstone Congregational Church, by the Rev. J. F. Poulter, B.A. Cantab. (great uncle of the bride), assisted by the Rev. G. H. Sandwell, pastor of the Church, Henry Havelock Brown, Esq., M.B., C.M., Holmlands, Leytonstone, to Edith, second daughter of Major T. J. Poulter, J.P., Assembly House, Leytonstone, Essex.

EASTERBROOK—FORRESTER.—On April 18th, at Morningside Parish Church, Edinburgh, Alexander Maitland Easterbrook, M.B., C.M. Edin., Gorebridge, Midlothian, to Emily Kenyon, younger daughter of the late William Forrester, of Arngibbon, Perthshire.

ELKINS—PEACH.—On April 19th, at All Saints', Leavesden, Herts, by the Rev. J. K. B. Watson, Chaplain of Leavesden Asylum, assisted by the Rev. Arthur Wilson, M.A., Vicar of the Parish, Frank Ashby Elkins, M.D., Medical Superintendent, Metropolitan Asylum, Leavesden, eldest son of Joseph Elkins, Stanford Mear, Yelvertoft, Northants, to Caroline (Lena), fourth daughter of the late William Henry Peach, Waingroves Hall, Derbyshire.

FARNFIELD—SIMMONDS.—On April 24th, at Dorchester Abbey, Oxon, William Walter Farnfield, M.R.C.S., L.R.C.P., of Mere, Wilts, to Elizabeth Esther Simmonds, eldest daughter of J. A. Simmonds, of Belvedere, Kent.

LYALL—NORRISH.—On April 19th, at the Church of the Holy Cross, Crediton, by the Rev. A. F. de Gex, Rector of Meachaw and Creacombe, assisted by the Rev. Prebendary C. Felton Smith, Vicar, David William Knyvett Lyall, M.B., C.M. Edin., of Shepton Mallet, Somerset, eldest son of D. R. Lyall, Esq., C.S.I., to Mary Ayre, younger daughter of D. M. Norrish, Esq., of Fordton House, Crediton, Devon.

MARTINEAU—WILLIAMS.—On April 21st, at St. Saviour's, Pimlico, Alfred John Martineau, L.R.C.P. Lond., M.R.C.S., of Hove, to Emma Louisa, elder daughter of Thomas Howell Williams, of Smeeton, Leicester.

WILKINSON—FISHER.—On April 21st, at Holy Trinity Church, Anerley, S.E., Robert Wilkinson, M.D. Brux., M.R.C.S., L.R.C.P. Lond., of Branksome House, Hamlet-road, Norwood, to Beatrice Mary, daughter of Robert Fisher, of Beverley-road, Anerley.

DEATHS.

AINLEY.—On April 24th, at Bournemouth, Daniel Ainley, M.R.C.S., M.O.H., County Borough of Halifax, aged 65 years.

ARCHDALL.—On April 20th, 1900, in London, Henry Stewart Archdall, M.R.C.S., L.R.C.P., late surgeon R.N., aged 32 years.

GRIGG.—On March 12th, at Wynberg Hospital, William Chapman Grigg, M.D., of Curzon-street, Mayfair.

JEFFREYS.—On April 21st, suddenly, at Brighton, Richard Parker Jeffreys, M.R.C.S., aged 59 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE FRIENDLY SOCIETIES' MEDICAL ALLIANCE.

THE twenty-first annual conference of representatives of the Friendly Societies' Medical Associations was recently held in the Town Hall, Chester, when the President of the council, Mr. B. Hulse, P.T. and P.H.C.R., A.O.F., delivered an address in eulogy of the "great friendly society movement." The value of the influences that have been brought to bear by the leading friendly societies upon a large public is not in dispute and we are not detracting from the position of the societies as national instructors in thrift and self-help when we allow ourselves to criticise the reference of the president to the medical side of these associations.

"One of the main objects of the movement," he said (we quote from the *Crewe Guardian*), "was to provide medical skill and medicine to the members when laid aside by sickness. Complaints had been numerous both as to the quality of the medicine supplied and the disproportionate attention given to private patients compared with the members of their societies. Hence they endeavoured to find a remedy, and the pioneers of the movement 30 years ago thought it was to be found in coöperation, and by combination together to rent or purchase their own surgery, engage their own surgeon, whose time and skill would be devoted to the wants of their members. They had had difficulties to contend with, but in spite of them they were conscious of the purity of their own motives. They believed there was a brilliant future in store for them. Their associations were not established for the purpose of money-making, but they were deeply anxious that the services of the best medical gentlemen might be engaged."

Now, this is a sensible statement of policy and is fair as far as a view of a subject can be fair when looked at from one standpoint. But the sick member is the only person considered. He is to have the best medicines and the best medical gentleman's services. These services are to be his and his fellow-members' exclusively, but there is not a word as to the scale of remuneration. Surely the remuneration should also be of the best. Here is a movement which the president claims to be of national importance, and good evidence could be found to support his claim. The medical attendance of the members is, according to his own words, one of the main objects of the friendly societies. It is desired that this attendance should be particularly good. Then surely the pay should be the same. There ought to be no question of pennies a week between successful national movements and the best exhibition of medical skill exclusively employed in behalf of that movement. Now, as a matter of fact, the medical officers of friendly societies are paid upon a low scale. Some societies pay better than others, just as some are better managed than others; but in those which have the most marked desire to treat their medical officers well the pay is not large, certainly not large enough to be considered a sort of good-conduct prize for scientific service of a high grade. And no amount of arbitration will, we fear, alter the position. We are in favour of arbitration, as by its means the medical men and the friendly societies may be able to hit upon arrangements that will be satisfactory to both, but we have not much hope of practical results while the friendly societies rate their members and members' health so high and their medical officers' services so low.

THE CAUSE OF DEATH IN SUDDENLY FATAL CASES OF HÆMOPTYSIS.

To the Editors of THE LANCET.

SIRS,—I submit the following to your discretion in the hope that if you insert it it may possibly elicit the views of some who are in a position to speak with authority on the subject. At 8.30 A.M. on March 23th, a gentleman, aged 28 years, on his way to the nearest station for Manchester suddenly brought up blood in large quantity. I saw him almost immediately after the attack. He was lying on the footpath, and though of course I could not measure the blood which was on the ground it was a large quantity. We conveyed him home (about a quarter of a mile) and put him to bed. Examination revealed marked disease in the apex of the right lung. His heart was healthy. It appeared that this was his third attack, the first having occurred in Canada six years ago and the second in this country 18 months ago. His wife said that he had not seemed to ail much since then and on the morning of March 23th had been particularly brisk and cheerful. He had other hæmorrhages, on April 1st at 4 A.M., on the 4th at 10 P.M., and on the 12th at 8 A.M., from which last he died. During the intervals he rallied well and seemed to be doing well and hopefully, except that the sputum never became quite free from blood. It was nearly free from blood on the night before the fatal attack. One peculiarity was that each hæmorrhage was smaller in quantity than the one before it. The last one was remarkably small and did not seem at all sufficient to account for the result. His last attack did not last more than about five minutes and

he died in it before I could get to him. I was with him during the last attack but one; this was not a long one, but was characterised by intense dyspnœa which reminded me much of the dyspnœa present in cases of embolism of the pulmonary artery. He was encouraged to cough without fear; the bleeding stopped in a few minutes, and though he was much exhausted his breathing became calm again, and he rallied. It seems to me that death in these cases may be due to one of two causes, either the loss of blood itself or asphyxia, the patient being, as it were, drowned by blood being poured [out into the lung or lungs and not able to get rid of it by coughing. I believe that the latter is the greater danger of the two, though I do not remember to have seen it stated anywhere that asphyxia was one of the dangers in these cases. In the case above related there was an interval of a week between the penultimate and the last hæmorrhage, during which the patient seemed to make a considerable progress for the better, the quantity of blood in the sputum being less than in the previous intervals; and, again, the last hæmorrhage was not more than about eight ounces or thereabouts. This does not look as if the cause of death were the same as in hæmorrhage other than pulmonary. That the patient died from asphyxia seems the only conclusion. The case was treated in the usual way except that no ice was used externally. It is grateful to the patient and, I believe, very useful, to suck the ice, but I have never been able to satisfy myself, though I have tried it in a good number of cases, that ice used externally does any good in hæmoptysis. On the other hand, it often succeeds in making the patient exceedingly uncomfortable. I have some misgivings, also, as to the value of such drugs as ergot in these cases, as to whether they are not more harmful than otherwise. Opium has appeared to me to be the most useful remedy for the condition. Apologising for these last remarks, which are irrelevant to the question I started with,

I am, Sirs, yours faithfully,

Stockport, April 18th, 1900. W. R. MANDER.

THE RESULTS OF MASTURBATION.

To the Editors of THE LANCET.

SIRS,—I shall be much obliged if you or any of your readers will assist me with advice in the following case. A patient, now aged 27 years, was in the habit of practising masturbation from the age of 16 to 20 years, at which latter period he abandoned the habit. From that time he was accustomed to have nocturnal emissions in connexion with sexual dreams, and though he often attempted intercourse could never succeed, erection not being sustained. Since the age of 24 years up to now the emissions have been numerous, quite unattended by any sexual sensations, and occur two or three times a week and occasionally more often. He is getting seriously alarmed and looks and feels bad. I have exhausted every method of treatment with which I am acquainted and should be glad to hear any suggestions as to treatment from those who have had similarly bad cases.

I am, Sirs, yours faithfully,

F. HARRIS, L.R.C.P. Lond., M.R.C.S. Eng.

Cape Town, March 13th, 1900.

. Some of our readers may have met with cases the treatment of which will suggest some useful point to our correspondent. These cases are very difficult to manage for many reasons, but in our experience they are quite capable of recovery. 1. The patient must abstain absolutely from all attempts at sexual intercourse and avoid carefully all that stimulates sexual desire. 2. He should take all the usual means to secure good general health. 3. He must carefully avoid constipation. 4. He should sleep lightly clad and should bathe the genitals with cold water before going to bed. 5. A tonic of iron and strychnine may be prescribed with advantage. 6. The patient must be encouraged to anticipate with confidence a complete recovery and he must as far as possible dismiss all thoughts about the whole subject. 7. The recovery will be slow.—ED. L.

"TO MEDICAL FREEMASONS."

To the Editors of THE LANCET.

SIRS,—At the time of the issue of the voting papers for the election to the Royal Masonic Institution for Boys and the corresponding Institution for Girls appeals were published in THE LANCET from various Masonic members of the profession on behalf of the only two "medical" candidates whose names appeared on the lists. I am glad to notice that both the candidates in question—H. E. Skrimshire and G. Hudson—have been successful. My present object in writing is to point out that at the coming election to annuities at the Royal Masonic Benevolent Institution there are two medical candidates—viz., No. 30 on the list of "Aged Freemasons," Charles Wyatt Smith, and No. 7 on the list of "Widows of Freemasons," Mrs. Dickinson. May I ask your readers whose votes are not already engaged to give them to these candidates? In Masonry certainly not less than in other fields medical men should lend their brethren a willing hand.

I am, Sirs, yours faithfully,

April 23rd, 1900. P. Z.

HOLIDAYS OF IRISH DISPENSARY MEDICAL OFFICERS.

MR. A. AITKEN, dispensary medical officer at Pettigo, in Donegal Union, when making arrangements for his annual holidays was informed that a fortnight was the period allowed him by the guardians. He, however, believed himself to be entitled to four weeks and was accordingly absent for that time. His substitute, Mr. Gilbert, who was to have been paid three guineas, thereupon claimed six guineas and brought an action against the Donegal guardians for that sum. Article 23 of the dispensary rules was to the effect that every medical officer shall be allowed an annual vacation not exceeding four weeks, and at Lifford quarter sessions on April 17th his Honour Judge Webb interpreted this as meaning an annual vacation of four weeks and no more. He therefore gave judgment in favour of Mr. Gilbert for six guineas and allowed him two guineas expenses.

Streptococcus.—Nothing, we fear, can be done. The recovery of the balance paid is a matter upon which legal opinion should be taken.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

During the week marked copies of the following newspapers have been received: *Midland Counties Herald, Oswestry Advertiser, Manchester Guardian, Northern Whig, Western Mercury, Western Daily Press, Brighton Gazette, Sanitary Record, Bristol Mercury, Times of India, Pioneer Mail, Citizen, Scotsman, Builder, Architect, Sun, Yorkshire Post, Rangoon Times, Leeds Mercury, Bury Guardian, Liverpool Daily Post, North-Eastern Daily Gazette, Poole Herald, Shield Morning Mail, Madras Mail, Sydney Daily Telegraph, Cheltenham Mercury, Bradford Observer, Chelsea Mail, Bolton Journal and Guardian, Cambridge Chronicle, Lancashire Daily Post, Hull Daily Mail, Daily Messenger (Paris), Norfolk Weekly Standard, Burnley Gazette, Forfar Herald, Wiltshire Chronicle, New York Herald (Paris), Eastern Daily Press (Norwich), Reading Mercury, City Press, Local Government Chronicle, Hertfordshire Mercury, Chester Courant, Woodbridge Reporter, Clifton Chronicle, Leamington Advertiser, Mining Journal, Local Government Journal, Surrey Advertiser, Weekly Free Press and Aberdeen Herald, Crewe Guardian, Lisburn Standard, Herne Bay Argus, Clifton Chronicle, Jersey Express, &c., &c.*

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, April 26th, 1900.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radiation. Vacuo.	Maximum Temp. shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks at 8.30 A.M.
April 20	30·50	E.	...	110	72	43	51	55	Hazy
,, 21	30·37	S.E.	...	111	79	48	52	52	Hazy
,, 22	30·25	S.W.	...	107	76	52	56	63	Fine
,, 23	30·13	N.E.	...	99	65	47	47	49	Overcast
,, 24	30·00	E.	...	98	53	44	46	50	Hazy
,, 25	29·93	N.E.	...	67	50	47	47	49	Raining
,, 26	30·15	S.E.	0·04	77	51	36	40	43	Fine

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (30th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (2 P.M.).

TUESDAY (1st).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), Guy's (1.30 P.M.), St. Thomas's (3.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (3 P.M.), Metropolitan (2.30 P.M.), London Throat 2 P.M. and 6 P.M.), Royal Ear (3 P.M.).

WEDNESDAY (2nd).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic 1 P.M.), St. Mary's (2 P.M.), National Orthopedic (10 A.M.), St. Peter's (2 P.M.), Samaritan (2.30 P.M.), Gt. Ormond-street (9.30 A.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M.), Cancer (2 P.M.)

THURSDAY (3rd).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.) University College (2 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M.), St. Mark's (2 P.M.).

FRIDAY (4th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M., Ophthalmic 10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (2 P.M. and 6 P.M.).

SATURDAY (5th).—Royal Free (9 A.M. and 2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), University College (9.15 A.M.), Charing-cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), London Throat (2 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

SOCIETIES.

TUESDAY (1st).—PATHOLOGICAL SOCIETY OF LONDON (20, Hanover-square, W.).—8.30 P.M. The adjourned Discussion on the Changes of the Blood in Disease will be resumed by Prof. A. Wright, Dr. Drysdale, Dr. W. Hunter, Dr. L. Smith (Belfast) and others.

WEDNESDAY (2nd).—OBSTETRICAL SOCIETY OF LONDON.—8 P.M. Specimens will be shown by Dr. Tate and others. Papers:—Dr. T. Wilson: The Relations of Organic Affections of the Heart to Fibromyoma of the Uterus.—Mr. A. Doran (President): A Case of Extra-uterine Gestation in which Fœtal Death occurred at the Eighth Month after Spurious Labour, Abdominal Section two months later.

THURSDAY (3rd).—HARVEIAN SOCIETY OF LONDON (Stafford Rooms, Titchborne-street, Edgware-road).—Paper:—Mr. J. D. Malcolm: The Selection of Cases for Abdominal Section.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.—8 P.M. Clinical Evening. Cases. 8.30 P.M. Mr. Nettleship: Note on Opaque Nerve Fibres of the Retina.—Mr. Critchett: Optical Iridectomies for Lamellar Cataracts.—Mr. F. M. Ogilvie: Eye Changes in a case of Bullet Wound of Head.—Mr. R. Bickerton: Case of Protrusion of Eyeball on Stooping.—Mr. W. T. Lister: Affection of Choroid.—Mr. Juler: (1) Emile Berger's Binocular and Stereoscopic Lens; (2) Proptosis with Ophthalmoplegia Externa.—Mr. T. Collins: Case with Congenital Notch in the Margin of each Lower Lid.—Mr. Higgins and Mr. Ormond: Specimen of Sarcoma of Choroid.

FRIDAY (4th).—WEST LONDON MEDICO-CHIRURGICAL SOCIETY (West London Hospital, Hammersmith, W.).—Pathological Specimens: Mr. L. Bidwell: A Series of Gall-stones. Paper:—Dr. B. Blacker: Treatment by Ultra-violet Rays.—Dr. S. Taylor; Notes on Two Cases of Membranous Colitis.—Dr. L. Dobson: (1) Notes on a Case of Foreign Bodies in the Mammary Gland; (2) A Case of Impacted Fracture of the Head of the Femur complicated by Infantile Paralysis.

WEST KENT MEDICO-CHIRURGICAL SOCIETY (Royal Kent Dispensary, Greenwich-road, S.E.).—8.45 P.M. Mr. C. J. Parke: What shall we do with our Inebriates? (Presidential Address.) To be followed by a Smoking Concert.

LARYNGOLOGICAL SOCIETY OF LONDON (20, Hanover-square, W.).—5 P.M. Cases will be shown by Dr. W. Williams, Dr. L. Turner, Dr. L. Lack, Dr. Tilley, Dr. Bronner, Dr. J. Horne, Mr. C. Symonds, Mr. Paget, and Mr. Waggett.

SOCIETY OF ANÆSTHETISTS (20, Hanover-square, W.).—8.30 P.M. Casual Communications. The Ordinary Meeting will be followed by the Annual Meeting for Election of Officers, &c.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MONDAY (30th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Mr. W. Anderson: Consultation. (Skin.)

TUESDAY (1st).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Dr. J. F. Payne: Consultation. (Medical.)

WEDNESDAY (2nd).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Mr. J. Cantlie: Consultation. (Surgical.)

THURSDAY (3rd).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Mr. J. Hutchinson: Consultation. (Surgical.)

FRIDAY (4th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Mr. T. Collins: Consultation. (Eye.)

EDITORIAL NOTICES.

It is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITORS," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this Office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE, OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers, not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index to Vol. II. of 1899, which was completed with the issue of Dec. 30th, and the Title-page to the Volume, were given in THE LANCET of Jan. 6th.

VOLUMES AND CASES.

VOLUMES for the second half of the year 1899 are now ready. Bound in cloth, gilt lettered, price 18*s.*, carriage extra.

Cases for binding the half-year's numbers are also ready. Cloth, gilt lettered, price 2*s.*, by post 2*s.* 3*d.*

To be obtained on application to the Manager, accompanied by remittance.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

The rates of subscriptions, post free, either from THE LANCET Offices or from Agents, are:—

FOR THE UNITED KINGDOM.		TO THE COLONIES AND ABROAD.	
One Year	£1 12 6	One Year	£1 14 8
Six Months	0 16 3	Six Months	0 17 4
Three Months	0 8 2	Three Months	0 8 8

Subscriptions (which may commence at any time) are payable in advance.

SUBSCRIBERS ABROAD ARE PARTICULARLY REQUESTED TO NOTE THE RATES OF SUBSCRIPTIONS GIVEN ABOVE. It has come to the knowledge of the Manager that in some cases higher rates are being charged, on the plea that the heavy weight of THE LANCET necessitates additional postage above the ordinary rate allowed for in the terms of subscriptions. Any demand for increased rates, on this or on any other ground, should be resisted. The Proprietors of THE LANCET have for many years paid, and continue to pay, the whole of the heavy cost of postage on overweight foreign issues; and agents are authorised to collect, and do so collect, from the Proprietors the cost of such extra postage.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the above rates, whatever be the weight of any of the copies so supplied. Address—THE MANAGER, THE LANCET OFFICES, 423, STRAND, LONDON, ENGLAND.

Communications, Letters, &c., have been received from—

A.—Dr. J. Althaus, Lond.; Messrs. Armbrecht, Nelson, and Co., Lond.; A. E. C.; Messrs. Allen and Hanburys, Lond.; *Archives de Stomatologie*, Paris; Mr. W. R. Adams, Lond.; *Alvedador del Mundo*, Madrid, Director of; Messrs. R. Anderson and Co., Lond.

B.—Mr. C. Birchall, Liverpool; *Birmingham Daily Gazette*; Bristol Royal Infirmary; Messrs. Burgoyne, Burbidges, and Co., Lond.; Birmingham City Asylum, Medical Superintendent of; Mr. L. Browne, Lond.; Dr. J. Bissell, Bern; Dr. R. D. Batter, Lond.; T. B. Browne, Ltd., Lond.; Dr. C. E. Beck, New York; Bradford Sanitary Association; Mr. W. H. Brown, Lee's; Mr. G. Barling, Birmingham; Mr. T. W. Bailey, St. Mary Cray; *British and Colonial Druggist*, Editor of; Dr. W. C. Bosanquet, Lond.; Birmingham Children's Hospital, Secretary of; Dr. Bérillon, Paris.

C.—Mr. T. Carwardine, Bristol; Dr. S. Crawshaw, Ashton-under-Lyne; Dr. E. Chaumier, Tours, France; Chelsea Hospital for Women, Secretary of; Carlisle Dispensary, Hon. Secretary of; Mr. J. E. Cornish, Manchester; Cardiff Infirmary, Secretary of; Cortland Wagon Co. Lond.; Dr. Colman, Lond.; Messrs. T. Christy and Co., Lond.

D.—Professor Deatre, Greeley, U.S.A.; Mr. A. Duke, Cheltenham; Mr. D. David Roath; Dr. L. G. Davies, Middlesbrough; Dr. T. O. Dudfield, Lond.; Dr. J. T. R. Davison, Buenos Ayres; Dewsbury General Infirmary, Secretary of; Durham County Asylum, Clerk of; Dunstable's Food Co., Lond.; Mr. T. Dixon, Lond.; Messrs. S. Deacon and Co., Lond.

E.—Dr. W. Elder, Leith; Evelina Hospital for Sick Children, Secretary of.

F.—Mr. R. H. Freeland, Lond.; Dr. R. T. Fison, Salisbury; Dr. P. W. Farmer, Melbourne; Mr. Hanbury Frere, Stradbroke; F. W.

G.—Dr. L. Grant, Edinburgh; Mr. Bryce Gordon, Lond.; Messrs. W. Green and Sons, Edinburgh; Dr. A. H. Griffith, Manchester; Messrs. H. Garnett and Co., Rotherham.

H.—Mr. W. Higson, Nottingham; H. A. H. C.; Mr. G. Heimanni, Lond.; Dr. J. B. Hellier, Leeds; Howard Association, Secretary of; Mr. E. Harris, Lond.; Mr. S. Hirzel, Leipsic; Mr. Reginald Harrison, Lond.

I.—Institute of Electrical Engineers, Lond., Secretary of.

J.—Dr. W. W. Jones, Bath; Mr F. B. Jefferies, Chatham; J. W. D.

K.—Mr. J. Kempster, Lond.; Mr. B. Kühn, Lond.; Mr. C. B. Keetley, Lond.

L.—Mr. C. Leudesdorf, Oxford; Mr. A. W. Lacey, Lond.; Messrs. Lee and Nightingale, Liverpool; London Press Exchange; Dr. S. H. Long, Norwich; Leeds Public Dispensary, Secretary of.

M.—Mr. A. Manns, Lond.; Mr. E. Merck, Lond.; Dr. J. Miller, Lond.; Messrs. Mason and Wales, Dunedin, New Zealand; Mr. W. C. M'Bain, Glasgow; Medical Society of Victoria, Melbourne, Hon. Secretary of; Maltine Manufacturing Co., Lond.; Mr. A. B. S. C. Morrogh Ebchester; Messrs. Maple and Co., Lond.; Mr. N. M. Macleod, Shandon; Manchester Royal Infirmary, Secretary of; *Midland Counties Herald*, Birmingham; Dr. C. McLarrin, Sydney.

N.—Mr. J. Norris, Lond.

O.—Messrs. Oliver and Boyd, Edinburgh; O.; Messrs. Orridge and Co., Lond.

P.—Mr. Penrose Philp, Lond.; Mr. F. Poland, Lond.; Dr. R. J. Probyn-Williams, Lond.; Mr. George Paull, Elswick; Mr. J. J. Pheean, New York; Mr. A. E. Peake, Iver; Mr. E. Pull, Chesham Bois; Dr. G. Petit, Paris.

R.—Royal Statistical Society, Hon. Secretary of; Royal Devon and Exeter Hospital, Secretary of; Messrs. Robertson & Scott, Edinburgh; Mr. D. Rice, New Eltham.

S.—Mr. Joseph Smith, Lond.; Scientific Press, Manager of; Messrs. Squire and Sons, Lond.; Messrs. Street and Co., Lond.; Messrs. Strowger and Son, Wigan; South Devon Hospital, Plymouth, Hon. Secretary of; Messrs. Sydney Bros., Lond.; Messrs. Sparks, Treherne, and Son, Lond.; Society of Apothecaries of London; Salford Royal Hospital, Secretary of; Scarborough Hospital and Dispensary, Secretary of; Dr. A. H. Stocker, Lond.; Messrs. G. Street and Co., Lond.

T.—Mr. R. H. Treweekes, Pembroke; Taunton and Somerset Hospital, Secretary of; T. J. C.; Mr. A. W. Tabuteau, Dunfanaghy, Ireland; Miss M. H. Tidy, Lond.; Mr. W. Tallack, Lond.; Dr. Toogood, Lond.; Dr. E. C. Taylor.

V.—Mr. J. Vasey, Northallerton; Victoria Hospital for Children, Secretary of.

W.—Dr. R. A. Wilson, Ruberv; Mr. J. Walsh, Mortarstown; Dr. R. T. Williamson, Manchester; Dr. D. Walsh, Lond.; Worth's Food Syndicate, Cheltenham; Messrs. Ward, Lock, and Co., Lond.; Mr. M. Westcott, Ipswich.

Y.—Mr. R. Yeatman, Liverpool.

Letters, each with enclosure, are also acknowledged from—

A.—Mr. R. R. Anderson, Fern Hill; Messrs. Armour and Co., Lond.; Association for Vaccine Lymph, Lond.; A. C.; Mr. Allen, Kingstown; A. W. B.; A. E. G.

B.—Mr. J. M. Bailly, Dublin; Mr. H. E. H. Bigg, Lond.; Mrs. Bridgman, Burton-on-Burton; B. and S.; Mr. L. A. Bidwell, Lond.; Messrs. J. L. Bullock and Co., Lond.; Bradford Royal Infirmary, Secretary of; Messrs. J. Bell and Co., Lond.; Mr. C. S. Bowker, Newport; B., Lond.; Mr. W. M. Beck, Blackburn; Mr. R. Baker, Lond.

C.—Mr. H. Connop, Bailsford; Chelsea Guardians, Clerk of; Dr. R. Cox, Theale; County Asylum, Shrewsbury, Clerk of; Miss E. Cuffe, Woodhall Spa; C. A. Y.; C. C. S.; Messrs. A. H. Cox and Co., Brighton; College of Preceptors, Lond., Secretary of; C. J.; Mr. W. B. Crockery, Eckington; Messrs. E. Cook and Co., Lond.; County Borough of Southampton, Accountant of; Mr. J. M. Carvell, Catford; Mr. H. E. P. Croft, Lond.; C. J. S.

D.—Dr. R. Davidson, Bournemouth; D. V. H.; Derbyshire Royal Infirmary, Secretary of; Messrs. Dowie and Marshall, Lond.; Messrs. H. Dawson and Co., Lond.

E.—E. L. C.; E. B. E.

F.—Mr. A. W. Forsaith, Lord.; Fisherton Asylum, Salisbury, Secretary of; F. C. H. M.; F. W. M.; Dr. J. K. Fowler, Lond.

G.—Mr. T. H. Gillam, Bromyard; Messrs. Gilyard Bros., Bradford; Goswell-road (89), Lond.; G. S.; Messrs. Gale and Co., Lond.; G., Bradford; G. B.; Mr. J. Good, Stockport.

H.—Mr. C. E. Hodgson, Newport; Halifax Union, Clerk of; Mr. R. F. Hiley, Hoddesdon; Dr. W. Harris, Hellesdon; H., Bristol; Messrs. Hastings Bros., Lond.; Messrs. Hogg and Son, Lond.; Mr. J. J. Hicks, Lond.; Mr. E. G. Hawkings, Plymouth; Halifax (Nova Scotia) Visiting Dispensary, Secretary of; Dr. V. Harley, Lond.; Mr. E. Huxley, Lond.; Mr. J. Heywood, Manchester; Mr. J. L. A. Hope, Addlestone; Hartlepool Hospital, Hon. Secretary of; H. E. C.

J.—J. M. N.; J. W. H.; J. M. C.; J. D. L.; J. F. H.; J. L. R.

K.—Messrs. Kilner Bros., Lond.; K. J. I.; Messrs. Keith and Co., Edinburgh; Dr. C. F. Knight, Portobello.

L.—Mr. J. L. Leckie, Pantypridd; Mr. H. K. Lewis, Lond.; Messrs. Lee and Martin, Birmingham; L. M. N., Manchester; Loughborough General Hospital, Secretary of; London Association of Nurses, Lady Superintendent of; Leeds General Infirmary, Treasurer of; Mr. F. Luther, Brighton; Messrs. R. and S. Livingstone, Edinburgh.

M.—Mr. W. A. Mushó, Lond.; Dr. W. A. McKeown, Belfast; Messrs. J. MacLehose and Sons, Glasgow; Medical, Douglas; Mental Nurses' Coöperation, Lond., Secretary of; Medicus, Leeds; Mr. H. B. Mole, Shepton Mallet; M. C. B., Lond.; M. P. H. Lond.

N.—Dr. T. B. Nariman, Bombay; Nottingham City Asylum, Clerk of; Dr. P. J. S. Nicoll, Lond.

O.—Dr. J. J. O'Hagan, Garston; Mr. R. Overy, Abbotts Langley; O. B.

P.—Dr. T. W. Parry, Youlgreave; Parish of Paddington, Clerk of; Dr. S. Poole, Wolverhampton; Dr. E. J. Parry, Ponty Cymmer.

R.—Mr. F. G. A. Rogers, Cardiff; Dr. W. Robinson, Sunderland; Dr. A. G. Richardson, Rhayader; Lady Russell Reynolds, Lond.; R. W. J.; R. H. H.; Mr. J. Harper Reid, Denniston, New Zealand; Royal Infirmary, Halifax, Secretary of; Dr. A. H. Robinson, Low Moor; R. H. G.; Miss E. Rouse, Lond.; Dr. R. M. Ralph, Mere; Messrs. W. A. Ross and Son, Belfast.

S.—Mr. E. O. Scallon, Wincanton; Mr. J. V. U. Somers, Richmond; Messrs. Sherratt and Hughes, Manchester; Mr. C. H. Sere, Lond.; St. Mary's Children's Hospital, Plaistow; St. Mary's Hospital, Manchester, Secretary of; Statim, Neath; Mr. J. Sampson, York; Mr. F. B. Smith, Port Talbot; Mr. F. Schloesser, Montreux, Suisse; Smith's Advertising Agency, Lond.; Dr. L. E. Stevenson, Temple Sowerby; Messrs. W. H. Smith and Son, Liverpool.

T.—Mr. J. Tibbetts, Fenton; Mr. A. H. Tubby, Lond.; Mr. F. Treves, Lond.; Mr. J. A. Thornhill, Horninglow; Dr. C. B. Taylor, Nottingham; T. G. B.; Messrs. J. Turner and Co., Queensferry; Trustee, Northallerton; Mr. J. Thin, Edinburgh.

U.—Union Assurance Society, Lond., Secretary of.

V.—Mr. W. Van Praagh, Lond.

W.—Dr. R. L. Wood, Knowsley; Mr. T. M. Watt, Cambridge; Wills, Ltd., Lond.; Mrs. J. Wysard, Lond.; W. C. S.; W. C; W. M. M.; Messrs. H. Wilson and Son, Lond.; W. H.

EVERY FRIDAY.

THE LANCET.

PRICE SEVENPENCE.

SUBSCRIPTION, POST FREE.

FOR THE UNITED KINGDOM.		TO THE COLONIES AND ABROAD.	
One Year	£1 12 8	One Year	£1 14 8
Six Months	0 16 5	Six Months	0 17 4
Three Months	0 8 2	Three Months	0 8 8

Subscriptions (which may commence at any time) are payable in advance.

ADVERTISING.

Books and Publications ...	Seven Lines and under	£0 5 0
Official and General Announcements	Ditto	0 5 0
Trade and Miscellaneous Advertisements	Ditto	0 4 6
	Every additional Line	0 0 6

Quarter Page, £1 10s. Half a Page, £2 15s. An Entire Page, £5 5s.

Terms for Position Pages and Serial Insertions on application.

An original and novel feature of "THE LANCET General Advertiser" is a Special Index to Advertisements on pages 2 and 4, which not only affords a ready means of finding any notice, but is in itself an *additional* advertisement.

Advertisements (to ensure insertion the same week) should be delivered at the Office not later than Wednesday, accompanied by a remittance.

Answers are now received at this Office, by special arrangement, to Advertisements appearing in THE LANCET.

The Manager cannot hold himself responsible for the return of testimonials, &c., sent to the Office in reply to Advertisements; copies only should be forwarded.

Cheques and Post Office Orders (crossed "London and Westminster Bank, Westminster Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Office, 423, Strand, London, to whom all letters relating to Advertisements or Subscriptions should be addressed.

THE LANCET can be obtained at all Messrs. W. H. Smith and Son's and other Railway Bookstalls throughout the United Kingdom. Advertisements are also received by them and all other Advertising Agents.

Agent for the Advertisement Department in France—J. ASTIER, 8, Rue Traversière, Asnières, Paris.